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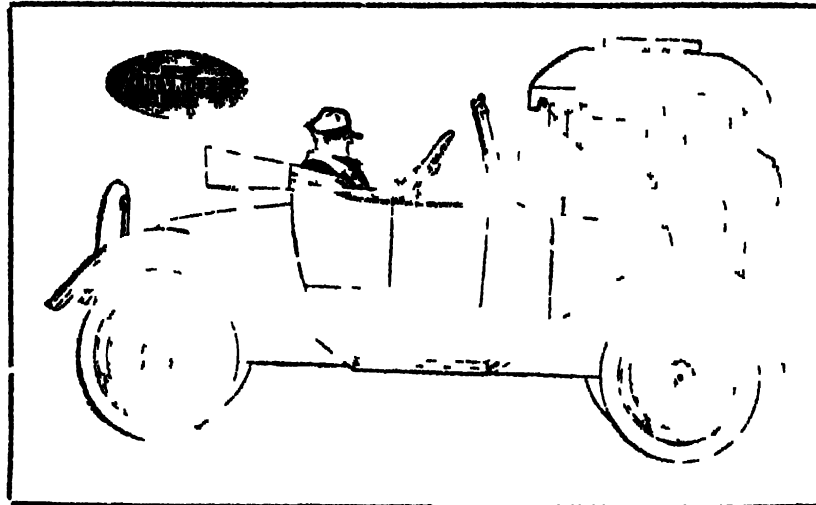
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BY

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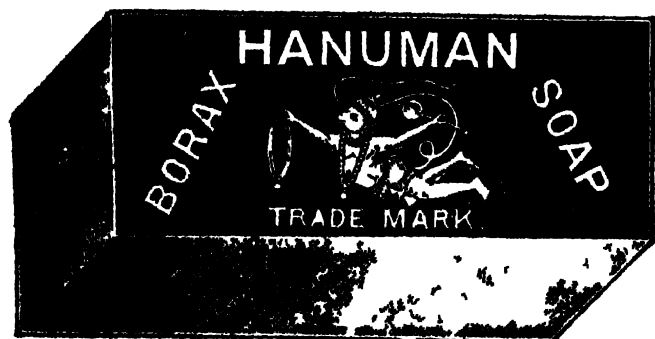
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No. IV

HOW THE WORLD MOVES

TRADE PROSPECTS IN INDIA AND THE EMPIRE

THE future of our trade and industry will depend on the amicable settlement of the great labour troubles. This is our view after a study of the events of the past year. After four years of extensive war effort and the enormous sacrifices in men and money, India has at last opened her eyes and realised that her salvation depended entirely upon the speedy utilisation of her man power and the vast resources in raw material for the building up of new industries and the revival of manufactures which have decayed for want of energetic attention, co-operation, encouragement and support. Young India, with her industries in a budding state and organising capital on joint stock system as is evidenced from the new flotations throughout the country, stands face to face with her American and Japanese competitors who were least affected by the war. After the Armistice was signed, they turned their main power to trade propaganda. "The United States which have saved Europe, are now ready to re-fit and equip Europe," was the motto of a well organised business campaign. India's resources are so great but her industrial organisations are yet to be vastly developed on the mechanical side with a view to make her self-dependent and to enable her to export her manufactures to other countries. Thus India will not only help herself in increasing her material prosperity but will also help foreign countries by supplying their wants.

Let us consider the position of Great Britain. Practically every British manufacturing industry is now supplied with orders that make five years' prosperity certain, the only notable exception being the manufacture of biscuits, preserves, and confectionery. India possessing as she does sufficient supplies of raw material for these industries will make a start at once with the fairest prospects of success. Further, the British textiles and machinery industries are over loaded with business while new industries are being started with the aid of "Key industries" which she had regained during the war as they passed out of her hands during the last generation. In two more departments she is lacking viz, sugar and shipping. But the Empire is better off than before the war and every possible attempt is being made to increase the production of sugar. In shipping, Britain expects to make good the losses of the war as the British shipping labour shows a robust sense of patriotism.

Before the war, owing to the German supremacy in the production of optical glass and dyes and in attracting industries allied to their production, the British Empire was falling behind in industries for which they are essential and also in industries allied with zinc and copper production, such as electrical

machinery manufacture which was monopolised by Germany. She had also to depend upon the United States chiefly for industries for which tools and machinery were essential. Before the war, Britain was not foremost in turning out sewing machines, typewriters, cheap motor-cars, cheap locomotives and the like while during the war as a matter of fact her position in regard to export trade was maintained remarkably well. During the current year, she is prepared to challenge the American lead by sending out largely to the foreign markets British sewing machines, typewriters, and cheap locomotives. In regard to her exports for 1918, she has shown a reduction of about 20 per cent when compared with the pre-war figures, in the value of her export trade within the Empire. British Export trade to India and the Dominions was worth £ 202,000,000, in 1913 against £ 150,000,000 in the year 1918 in spite of the fact that she was mainly engaged in the dreadful war with Germany and the maintenance of her export trade was only a side show. In view of the vigorous developments of Imperial Preference now taking place, Britain proposes to use the Empire's wool, leather, grain, meat and metal resources for Imperial production and trade and to strengthen her commercial supremacy of the world.

As far as India is concerned, here are splendid opportunities for business but only on condition that unity between employers and employed can be secured. Whatever India can produce, the Continental Markets of Europe, the great Latin Republic of South America and the re-awakened China are ready to take. The fact that there are vast accumulations of raw material in India need not be overstated. Millions of tons of timber and forest produce in India can be turned into finished products for our home market and all surplus may be profitably exported to other countries which

are in want of it. It is hoped that more and more shipping gradually will become available.

Need for Skilled Labour and Technical Schools

During the war, people greatly suffered owing to famine conditions and abnormally high prices which, after the war, have become permanent. It has been stated that they will be maintained at least for several years to come. As a necessary consequence, the demand for higher wages is perfectly legitimate and should receive the careful attention of every fair-minded person. In this materialistic age, labour has awakened to a realisation of its consciousness and strength and is determined to have a fair share of the fruits of its work. It should be admitted at the same time that it is unreasonable and suicidal for them to put forward undue demands so as to cripple industry. In certain localities and in particular industries, it has been felt that labour was not skilled and energetic and amenable to discipline so that industry necessarily suffered as a result of idleness and inefficiency, besides the clamour for higher wages. This point requires also due consideration. It is therefore not possible to arrive at a scale of wages in any particular industry or concern especially owing to fluctuations in the amount of the work and enterprise put into it.

One remedy that may be suggested is the establishment of training schools for Labour in the various departments of business in all the important centres of India affording facilities for practical training besides the regular instruction imparted in the class-room. It is the primary duty of the Government to establish such Business Training Schools in as many centres as possible and when the question of inadequacy of funds is raised, this item of expenditure in the Budget should always be pressed for preferential treatment. The allotment of Funds for this purpose should be viewed in a productive sense. The demand for

skilled and efficient labour in India is daily on the increase and the sooner steps are taken to train Labour the better for the Government and the people. When more schools of this kind are established and hundreds of trained youths are sent out for ready employment in business concerns, the Government will surely have less anxiety and greater profit. As the profit earning capacity of the industries is increased by the employment of skilled labour, the employees, besides gladly satisfying the demands of Labour for higher wages will be in a position to bear the burden for additional taxation. But, the idea of first raising heavy taxes in the name of Education including technological education and then promising to open schools will not find favour with the people. The mercantile and business community has been suffering heavily in the absence of skilled labour. The demand for efficient clerks, Book keepers, Accountants, Typists, Salesmen, Managers and Secretaries is keenly felt. It would be a terrible national calamity if this neglect were allowed to continue.

If the Government are likely to delay in taking the necessary action in the matter, it devolves upon the people, particularly the Mercantile and Business Community who feel the pinch to unite, organise, collect funds and establish institutions for the spread of technical education in India. Technical Education is yet in its infancy in our own country so that there is considerable scope for the people to take the lead in the matter and to run more institutions controlled by private enterprises side by side with the Government schools even if the latter are likely to spring in any appreciable degree. Thus the establishment of Technological Schools at an early date will considerably reduce our labour difficulties. If this remedy is not applied, labour is bound to degenerate into an automatic machine which will be handled by professional agitators who thrive on labour

troubles. Lastly, the only fair system which will benefit the employer and the employee and avert all labour troubles is co partnership. This system will work satisfactorily only when Labour is working under trained and efficient conditions, realising its duties and responsibilities.

What is India's Allotment for Education?

It has been repeatedly brought to notice on the platform and in the Press that the remedy for the greatly increasing economic distress and famine in India lies in a proper and efficient system of education which will increase the earning capacity of the workman and improve the methods of production. The British Government propose to spend £ 58 millions on education which together with all sorts of local contributions will reach £ 100 millions for a population of 45 millions souls. The Ministry of Health propose to spend over £ 27.5 millions. Thus the average expenditure per head for annum is £ 3 on health and education. Now that Education and Industries are transferred subjects, the future responsibility will rest on the Indian Ministers under the R form Act to make the people of India healthy, wealthy and educated. Great Britain spends annually only 7½ millions on police and prisons. The wisdom of the Government evidently lies in making adequate provision in the Budget allotment on Primary and Secondary Education and more especially on Industrial and Technological Education which is the crying need of the people from Cape Comorin to Himalayas. This is the surest and only course to reduce poverty and crime in India. When Great Britain spends £100 millions for 45 millions of people, what is India's Budget allotment for a population of 315 millions for the year 1920—21 on Education?

The Sri Mulam Technical School

The opening of this school with effect from the next academic year has been sanctioned by the Government of H. H. The Maharajah of Travancore. It will be attached to the P. W. Workshops, Trivandrum. There will be two classes viz., the mechanical overseers class to which the pupils holding the English school leaving certificate will be admitted and the Fitters class to which admission is open.

to pupils holding the Vernacular school leaving certificate. The duration of the courses will be two years each and the fees per annum are Rs 96 and Rs 24 respectively. Both theoretical and practical instruction will be imparted. The expenditure on account of this Institution is estimated at Rs 6,915 for the first year. The question of the further development of the school will be considered after a period of two years. The Travancore State is to be congratulated on the establishment of this useful institution which we trust is only the beginning of the future Technological institute. It is hoped that the other Indian States and provinces which are yet backward in point of Technological Education will follow this excellent example set by this progressive State.

Income-tax Produces Industrial Stagnation

President Wilson in his recent message to the Congress urged the reorganisation of the taxation system, with the simplification of the income and excess profits taxes and the readjustment of tariff system in conformity with the fact that the United States is the "greatest Capitalist in the world" since American business is full-grown. "No policy of isolation will satisfy the growing needs and opportunities of America," continued the President. As regards Labour, he said "The workman demands an adequate wage, he demands the right to live, and the right to work amidst sanitary surroundings both in his home and in the workshop, and the right to provide for his children's wants in matters of health and education." He declared that Labour was not only entitled to an adequate wage but Capital also should receive an adequate return for its investment and also Government protection in every emergency.

As regards Revenue Legislation, he urges the Congress to consider whether higher rates of Income and Excess Profits Taxes are effectively productive of Revenue in peace times and "whether they may not on the contrary be destructive of business activity and productive of waste and inefficiency." He concludes by adding that "There is a point where high rates on incomes and profits discourage energy, remove incentive to new enterprise, encourage extravagance, and produce industrial

stagnation." In India, the Income tax Law has so far produced uneasiness, discontent and sometimes business dislocation among the merchants who had been often assessed on the strength of the "best information" received after enquiry by the Income-tax Inspectors. One good and indirect result of the administration of this Law, however, will be that the merchants who had hitherto neglected the business of book keeping will be compelled to maintain regular and systematic accounts on a recognised basis which is productive of immense good to the business community. On the other hand, the hardships the assesses are labouring under ought to receive due consideration while the Income Tax Law should be substantially amended so as not to cripple the indigenous industrial enterprises of the country which require the forerunning care and support from the State and the Public.

Mr Balfour on Research

The attention our readers, particularly of those interested in the scientific and industrial problems of our great country, is invited to his address to the Conference of Representatives of Industrial Research Associations in England which appears elsewhere in this number. Mr Balfour who is eminently fitted to undertake the responsible position of his new appointment as the Minister of the department of scientific and Industrial Research is regarded as a "national gain." This new department has been engaged in doing valuable work in three directions firstly in stimulating the production of competent researchers, especially by making grants to promising men, secondly, in encouraging industries to use first rate men of science for the solution of their special problems, thirdly, organising inquiries into scientific and industrial problems of national importance by means of research councils. By mobilizing "the science of universities and of technical institutions" Germany had given opportunities and rewards to those who devoted themselves to the application of science and thus placed all the new scientific knowledge and trained investigators at the disposal of industry. We cordially invite the attention of competent Indians in the matter to place their views before the public in the interests of our industrial progress.

A MODEL OF INDUSTRIAL CO-OPERATION

By Mr K S Abhyankur, B A.

THE development of co operative organizations in India so far, referred mainly to providing cheap credit. Co operative credit is the first lesson in the movement, for as pointed out by Sir Horace Plunkett "so far at least as the poorer members of the community are concerned, I hold that co operative credit is by far the most valuable branch of co operation. I do so because I found in my own organising days that once the mysteries of finance could be explained to a body of men, all the other forms of co-operation became comparatively easy. Co operative credit thus prepares the ground for other forms of Co operation. Having developed co operative credit, the co operators in India are now taking in hand the organization of Industrial co operation. This form of the movement has specially developed in England, and a brief sketch of the history and activities of an Industrial co operative concern in that country will not fail to interest the general reader and may serve as a model to the active co operative worker.

The Leeds Industrial Co-operative Society, commenced its work more than seventy years ago and its history is a record of steady development. It commenced its work in 1847, under the name the Leeds District Flour Mill Society with the object of supplying people with pure unadulterated flour, at a reasonable price, at a time when it was scarce, bad and dear and at a time when wages were low, hours of labour long, work scarce, food adulterated and the introduction of the powerloom and other machinery seemed to have greatly dislocated industrial conditions. At the first meeting 433 members joined the society and in two months the membership rose to over 1,000. In 1853, the scope of work was widened, and the name was changed to the Leeds Co-operative Flour and Provision Society. It

was in 1858 that the 'Rochdale plan' of retailing flour, groceries and provisions, by the employees of the Society, at its own shop, and of sharing the profits according to purchases, was first tried. Clothing business was taken up in 1859 and then coal and meat. In the meanwhile several branches of the Society were opened in Leeds and District. The society was the first in Leeds to reduce the hours of work of its employees by closing one hour earlier in the evening and also by closing half a day each week. In 1872, when the twenty-fifth anniversary of the society was celebrated the profits reached over £10,000. During that year an Education Fund was started and a Co-operative Building Department added.

Since then the progress has been steadily kept up. New buildings have been acquired, more branches opened, coal and grain, boats and coal wagons purchased and new departments like tanners and wheelweights works, a restaurant and confectionary have been added. In 1907, was celebrated the Diamond Jubilee of the society, when a splendid exhibition of Co-operative productions was held.

To-day the activities of the society extend to almost every necessity of life. It is to be noted that nearly 28½ per cent of the supplies come from Co-operative sources including the productive works of the society itself. There is a feeling that this percentage ought to grow. There is also movement in the Society for joining the Co-operative Wholesale.

The following figures from the report of the Society for the half year ending 31st June 1919, when it was just recovering from the effects of the Great War, will give a clear idea of the extent and nature of the activities of the society. The total sales during the half year amounted to £1,810,959 an increase of

£ 504, 415 over the figure for the corresponding half of 1918. The share capital stood at £ 1, 2/9, 688 and including the loan capital, the total capital stood at 1,292, 117. The number of members at the end of the period was 76, 258, a number which must by this time have come up to nearly 80,000. Dividend on members' purchases was paid at 2/4 in the £. On referring to the figures for India, it will be found that the capital, the scope of activities, and the membership of this one individual society can very well compare with the capital, the scope of activities, and the membership of all the societies put together in an Indian Province.

Some offshoots of the Society may be noted here. A journal called the *Monthly Record* was started in 1878. It is distributed gratis and discusses co-operative topics and also special topics relating to the society.

The *Women's Co-operative Guild* commenced its work in 1889. Its object is to have an organised band of women in connection with the society to help to spread a knowledge of the principles of co-operation and to draw co-operative women together, in a friendly way for mutual helpfulness in domestic, social and intellectual subjects. A *Men's Co-operative Guild* has also been formed with similar objects.

We have already referred to the starting of educational activities in connection with the

Society in 1872. These comprise classes on co-operation for children, classes for the Technical Training of junior co-operative employees and salesmen including a book-keeping class, Libraries and Reading Rooms and Concerts, Lectures and Socials. Political education is also going forward in a practical way.

It will not be out of place to refer here to a new development in the English co-operative world and that is the formation of a co-operative party, Co-operators are contesting elections in the interests of this party. Just as we read of a Liberal M.P., or a Labour M.P., so we now read of a co-operative M.P. At the last Municipal elections in Leeds, two co-operative candidates took part in the contest and 'the first effort of the co-operative party in Leeds to have a direct voice in the management of their civic affairs' was remarkably successful.

Before concluding the report, from which we have quoted before, the President of the Society remarks, "co-operation is still the most effective weapon for combating trusts and combines and the need and opportunities for its application were never greater than today." We in India, lately complained of Profiteering and High Prices—co-operation will be an effective weapon to reduce these evils, as the little experience we have gained in this country so far, clearly shows.

MONEY IN PINEAPPLES.

By Mr R. Rollo Platel

Sir F. A. Nicholson's recently published plea for the encouragement in this Presidency of a fruit-growing industry on systematic lines by providing actual and intending fruit growers with facilities for acquiring a knowledge of better methods of cultivation and of marketing their produce is, of course, not the

first that has been put forward on this vast and promising subject, but it is certainly one of the most lucid and convincing that has yet been addressed to a Government and a people, who must share between them the blame for the largely and inexcusably undeveloped and unorganised condition of such

fruit industries as we can now boast of in Southern India. If our Presidency is not in a position to do a world trade in respect of native or exotic fresh fruits in consequence of the absence of refrigerator and cold storage facilities and of rapid land and sea transport, that is no reason or justification why she should suffer her many highly promising fruit industries to remain undeveloped until altered transport conditions appear. Such altered conditions will come only after we have sufficiently developed and expanded, not merely our fruit industries, but our several other promising industries in the production of perishable foods and such substances and in their proper preparation for the markets in which they would be welcomed.

The now colossal and splendidly organised fish export industry of the Moray Firth and other fishery centres of the United Kingdom had already existed on a fairly considerable scale before the costly systems of piers, motor boats and railways were laid down to admit of the rapid distribution of fresh fish to the various inland cities and towns. The West Indian banana farming and export industry had given adequate evidence of its vast potentialities before State aid and private enterprise combined to build up the splendid land and sea transport services, which are to-day engaged in placing millions of bunches annually on the fruiterer's stalls in the United States, the United Kingdom and continental countries. Similarly, Australia had already established a fairly extensive local industry in frozen meat, fresh fruit, and even eggs and other perishable produce before the great steamship lines deemed themselves justified in providing special transport, with coal storage and such other facilities, to admit of all these products being placed on far more distant markets. There are, at the present day, not a few countries which,

notwithstanding the absence of such transport provision, are actually maintaining remunerative fruit industries, even if it is not found possible to carry on anything like an ambitious business in the export of fruit in the fresh state. For instance, the manufacture of jams, jellies, fruit pulp, preserves, syrups, etc., the crystallising and desiccation of fruit, the pickling of fruit and vegetables and allied industries are among the sources of national wealth in Europe and America, in Japan and in some of our self-governing Colonies in all of which, they provide remunerative employment for large numbers of the working classes, and this too in spite of wages being both comparatively and absolutely higher than in India. The pineapple canning industry of the Straits Settlements furnishes us with a striking and valuable object lesson, which, without any extraordinary degree of industrial enterprise, we ought to be able to imitate with plenty of profit to ourselves. Shortly before the outbreak of the European war, there were sixteen pineapple canning factories working in Singapore, all but one of them being Chinese owned, and their annual output was half a million cases of the value of 2½ millions State dollars. In 1914, the imports of canned pineapple from the Straits to the United Kingdom alone were 216,348 cwt, valued at £266,323, while for 1915 the figures were 305,799 cwt and £401,732. Siam also, speaking only of Asiatic countries, used to do a fairly large trade in canned pineapple with the United Kingdom and other European countries until the war caused such a disorganisation and paralysing of ocean-borne trade and commerce.

Several varieties of the pineapple, which, as may be known, when raised with even ordinary care and trouble, is one of the most luscious and delectable of tropical fruits, are raised in various portions of the Madras

Presidency, where the shrub represents one of numerous successfully acclimatised exotics. The original home of the plant is South America, where it inhabits sandy maritime tracts in the North Eastern states. From Brazil, it was taken across Europe by the adventurous Spanish and Portuguese settlers, and being a hardy colonist, it soon established itself on the continent, the Dutch, in particular, raising it with notable success, though endeavours to successfully cultivate it in Great Britain, in glass houses have never met with any great amount of success. The Portuguese, who were celebrated for the instinctive enterprise wherewith they enriched countries, in which they settled, with all sorts of exotic trees, plants and shrubs gave us the pineapple, just as they have given us the palmyra, the cashew, the mahogany, the papaya, the guava, the mangosteen and other useful members of the vegetable kingdom that are now thoroughly established in several portions of India.

At the present day, the pineapple grows more or less luxuriantly in Bengal and Assam, at the foot of the Himalayas, in Western India, in Burma, Ceylon, Siam, the Straits and in many parts of our Presidency, its range being, therefore, almost identical with that of the useful cassia or tamarind plant, which, by the way, is another vegetable settler from the distant Western hemisphere. In some Districts in this Presidency, it may even be found growing in a semi wild state, as an escape from cultivation. On the West Coast, the fruit raised is of very fine flavour, although cultivators do not, as a rule, expend any special care in the management of their pineries. The shrub thrives most luxuriantly in the soil of the Ernad or Moplah country, which is a rich brown earth, free from gravel. Several years ago, the Divisional Officer in Malabar, Mr W E Cotton, I C S, laid out a pinery in Tirur, where pineapples of a special-

ly fine quality have long been grown, but with Mr Cotton's departure, the pinery was neglected and soon disappeared. Excellent pineapples are also raised in the neighbourhood of Mahe the produce being generally plentiful. Besides ordinary varieties of the plant, the large Mauritius and Kew races, which many people consider to be of superior quality, have been very successfully grown here and there in our Presidency, chiefly, however, by Europeans, for their private use and not as a business undertaking. The green Mauritius race, for instance, was introduced very many years ago in Calicut by an European gentleman, with a passion for horticulture, and it has continued to grow there without betraying any deterioration in respect of size or flavour. The Kew pine has grown and fruited very successfully on the Travancore Hills, whose potentialities as a fruit growing region may scarcely be exaggerated. A fair amount of internal trade is done in Malabar in the sale of fresh pineapples, besides which, small quantities are railed to Bangalore, Coimbatore and other stations, but a large and regular trade in the export of the raw fruit remains to be created, while, as almost goes without saying, pineapple canning is still an unknown industry. The raw fruit keeps fresh and wholesome for several days together, even under tropical conditions, and so far as the Malabar produce is concerned, it has the advantage of being cropped in the early portion of the South West monsoon, and this should enable it to remain fresh and wholesome even longer than would be possible in the hot and sultry months. Malabar these past few years has been developing a profitable industry in the export of mangoes to numbers of stations in Western and Upper India and Bengal where there appears to be a very brisk demand, although, in point of fact, the quality of much of the fruit cannot be said to be high. Carefully raised pineapples, at this

rate, should have no difficulty in finding profitable markets in several parts of India, but the first essential would be to induce pineapple cultivators to adopt systematic and improved methods of cultivation, while it would also be very desirable to introduce some of the best varieties from the West Indies, as well as from the Straits, and experiment with them locally. There is no reason why they should not justify their importation. A good many varieties of the pineapple are recognised in cultivation and they differ from each other in size, shape, flavour and colour of the fruit, as well as in habit of growth and constitution, but the larger fruits are by no means necessarily the best flavoured or endowed with the best keeping qualities.

Apart from an export trade in the fresh fruit, pineapple tinning or canning ought to prove a very remunerative industry, especially if established in the vicinity of the pinery and within convenient distance of the railway. These conditions would not be difficult to find in those portions of the West Coast which have amply shown themselves to be excellently adapted for pineapple cultivation, another decided advantage in favour of which is the circumstance that the pineapple can be successfully grown even in soil which is too poor to produce ordinary vegetable crops, provided it has no tendency to become waterlogged and provided also that extremes of temperature would admit of being modified by sea winds. The Chinese in Singapore use the pineapple for canning in various stages of ripeness, according to the requirements of purchasers, and either whole or in slices, chunks or cubes. The contents of the tins are covered with syrups, composed of water mixed with refined cane sugar, or with the juice of the fruit mixed with an equal

quantity of water, the former being known locally in the trade as syrup grade and the latter as own juice. Much of the process of canning is done by hand labour. In the Hawaiian Islands, on the other hand, modern factories now effect the various processes of peeling, removing the eyes, coring and slicing the fruit, etc., prior to tinning, by means of a series of patented machines which have almost eliminated the necessity for touching the fruit by hand. Obviously, in the event of a pineapple canning industry being created in this Presidency, the modern machine processes would be most desirable regard being had to the commendable hygienic susceptibilities of the people. In addition to the fruit, the leaves of the pineapple possess a certain degree of economic value, furnishing, as they do, a fibre of fine quality and great strength suitable for delicate textile fabrics also for fishing line, ropes, etc. It is nearly white, very soft, silky and pliant, and, at the same time, strong, durable and susceptible of fine subdivision. For fibre production, however, the plants have to be grown closer together than when fruit only is required, in order to induce the plant to form long leaves, or they may be grown under trees in partial shade, with this end in view, fully developed leaves yielding the best fibre, but they must not be too old, as then the extraction of the fibre becomes extremely difficult, and for the same reason, they should be treated as soon as possible after being taken from the plant. The preparation of the fibre involves tedious hand labour, but, in this country, there is no reason why it should not prove very fairly profitable as a cottage industry, suitable for women and girls. Several machines have been invented for decorticating the fibre, but so far, the fibre they produce has not equalled in quality that obtained by hand methods of preparation.

INDIAN COMMERCIAL ACTIVITY.

By Pratap Chatarji, B Sc

WHATEVER may be the effect of the war in other countries, it has however, clearly shown to us, Indians, how much helpless we are in ourselves and how much dependent on others. We have seen how we have looked upon the generosity of other countries for the things we daily use and what an amount of wealth has, in that way, been soaked in by the profiteers. That is why, with the sounding of the death knell of the war, the Renaissance of Indian Commercial Activity has come. The consciousness of our extreme helplessness and increasing poverty has struck deep into our hearts and so, with the end of the war, numerous companies have opened up. It is a good sign. But we must not rejoice very much, since this is but a preliminary, the number of companies to meet the demands of 315 millions of men is negligibly small. India has a vast field of commercial activity, with abundant and exceptional possibilities,—if only her people have a mind to be up and doing.

Among those companies, that have opened up, many may fall and many rise. But, I believe, the failures or risings are mostly due to the negligence about some vital points, which the organisers take to be minor ones. In fact, the whole structure of a concern depends upon those points.

(i) India is much behind hand in the art of advertising. There may be first class business concerns, but no one may have known about them! A concern at Madras is left, due to want of advertising unknown to other provinces,—think of that! One can see the abundance of advertisements in the western countries—in stations, in hotels, in streets, in news papers, in theatres, in trains, in cars and taxis and in a thousand other places. These advertisements pursue him wherever he goes. How will a business flourish, unless the people,—who are to patronise it,—know

of its very existence? Lacs of money are spent in the west for advertisement and, mainly, this gives them so much success.

(ii) The next point is a most important one which should insure immediate attention. The experience we are getting from the perusal of news papers should be an eye opener.

It is the matter concerning labour. The men, who serve their employer, should be liberally provided for. We have already heard of the warning note how the tyranny of the Capitalists on the labourers has ushered in the horrible Bolshevism in Europe, and we must try our level best to bar the birth or entrance of the monster in India. We must not allow discontent spreading its webs among the labourers of our country.

(iii) Stricest honesty and punctuality should be the ideal, and are, undoubtedly, the only way to secure the good will of the public. I have often observed that a business, which had been lately going on well, suddenly was compelled to light the red lamp on account of the unexpected fall in the number of customers. Courtesy is also a potent factor. One, who has amassed some money by business, may ignore these points, being blinded by his successes but, no doubt, his concern will be soon on the way to ruin.

(iv) Some courage is also needed. We must remember the maxim, failures are but pillars of success. There may be failures in the first instance, since Indian mind has scarcely been directed towards such an end, but we must keep to the line.

A new era of the Commercial and Industrial India has dawned. To make it complete success, we must use all our intelligence, experience and strength. At the same time we must act according to the dictates of our heart and towards the furtherance of the common good of our Mother-land.

THE COMMERCIAL CLERK

By Mr B S Ramaswamier, B A L T,

MUCH of the insignificance attached to the profession rests chiefly with the individual. He rests content with what he has and what he earns and never tries to lift himself up. He confines himself to a particular groove. He is thus doing his work mechanically without the application of any higher powers. But sometimes a change of atmosphere and a change of place will do him much good. He should start his life afresh and adopt himself to new conditions and surroundings. He can thus avoid much of the dull monotony of life and do his work with sprightliness and vigour. He looks then lively and cheerful and forms an indispensable element to the commercial world. He can shake off the lethargy and discontent about him and enter into his work with renewed vigour and activity. His aim should be to rise high, occupy the highest position. Even if he fails to secure it, his aim should never be low. 'Be king in your dreams' is the motto of a millionaire. There is no harm in aiming high and keeping steadily to it.

Primarily he should have a knowledge of the three R's. With that he can hope to be in life as a junior doing the ordinary routine work in the office such as indexing, copying and so on. He should, in the meanwhile, try to acquaint himself with every branch of work and do it piecemeal. He should be a little inquisitive to learn how the senior clerk does his portion of the task. He should never go in for assistance unless he is driven to the extreme necessity. He should thus learn to know all branches of work. He is then fit to hold all the responsible posts in the office until, in the long run, he can rise to be the head or the manager. He should create a chance himself. The plea that there is no chance is groundless.

What are the qualifications of the correspondence clerk? As said above he should have a knowledge of the three R's. He should know the ordinary routine work of indexing, Pencil writing and so on. He should be fully conversant with the different kinds of address and letter writing. He should be able to do business by letters and advertising. The letters in fact should speak for themselves. He should know one or two foreign languages. In England, French and Spanish are much in vogue. But the choice depends on special conditions. In India it seems a knowledge of Tamil, Telugu, Malayalam, Canarese and Hindustani is quite essential. He who knows languages other than his own, provided he has the necessary qualifications in commercial subjects, will be valued highly. He has the chance of coming into contact with his Principal who is thus in a position to judge him by his work thus opening up a chance for his promotion. A knowledge of the important trade routes of the world is highly necessary. As occasions may arise to discuss about the comparative advantages and disadvantages of sending letters to a place which can be reached by more than one route. He should be thorough in postal rules and measures. He should have everything in his head to avoid reference to the books often. Besides he should suggest time and labour saving devices to his Principal who may not have time to go through every branch of work in detail except to effect a general supervision over all. What has been said above as regards foreign languages applies chiefly to the foreign correspondence clerk. His position is unique as being the only one who knows the various languages so that he may be sent to foreign countries to carry on effective business on behalf of his Principal. He is responsible for

all the losses or gains of his employer as he is fully entrusted with the care and management of foreign business. He has an opportunity of studying the different trade systems of foreign countries, thus adding materially to his knowledge. He will thereafter be looked upon as an authority on matters foreign. His Principal will have no mind to leave him as it will affect his pocket.

A few words about the Book-keeping clerk. He should be well up in the principles and practice of accounting. He should suggest easy method for the collection of debts from the customers. He should be up to date in keeping the ledger accounts. He should have a thorough grasp in Commercial arithmetic as regards short methods and simple calculations. He should possess accurate information about foreign currency. He should be up to the mark in Company Law, the Partnership Act and so on. It is rightly said that correctness, neatness and quickness are the three essentials in Book-keeping.

A knowledge of Shorthand and Typewriting will not be in vain for the Commercial Clerk. In fact, it forms the stepping stone to higher posts. It brings him into contact with his superior every day and that means so much influence gained for his advancement. The ability to take down notes accurately in shorthand and type them correctly raises him very much in the estimation of his employer. This is a means also of improving his knowledge of English Language and Composition, and he

should largely add to it by studying good books in literature. Type-written matter, when well arranged and properly set out, fascinates the eye and forms a recommendation by itself.

Next about the managing clerk and his attributes. He should have a ready knack of controlling his subordinates effectively without creating any friction amongst them. It is said that friction is the arch-foe of the engineer and so also it is in business. Hence the want of harmony amongst the clerks and himself may thoroughly upset the smooth working of the machinery. In small business houses he has also to do the work of advertising so as to appeal either to the emotions, tastes, humour or commonsense of the readers. Something has already been said as to the method of doing business by letters and advertisements. Effective Salesmanship by letters forms an important accompaniment to his other requisites.

To sum up, a quick head for figures, a ready hand for taking notes, an accurate knowledge of commercial geography and commercial law and a vigilant eye for supervision are highly necessary for success in life.

It will not be amiss to say a few words about the relation of the clerk to the Principal. "He should be loyal to his employer, loyal to his business and lastly loyal to himself." It is hoped that the foregoing hints may be useful for a clerk to achieve success in life.

INDUSTRIAL POLICY OF THE GOVERNMENT.

"I beg to record my opinion that in the matter of Indian industries we are bound to consider Indian interests firstly, secondly and thirdly—I mean by 'firstly' that the local raw products should be utilised, by 'secondly' that industries should be introduced, and by 'thirdly' that the profits of such industry should remain in the country." Sir Frederick Nicholson

"We do not want merely Indian Capital. We want Indian men, and not Indian men

only as labourers, but as leaders who will turn their attention to industrial enterprise and equip themselves for a great industrial regeneration in India." said H. E. Lord Chelmsford.

Sir William Clark said that "the building of industries where the Capital, Control, and Management should be in the hands of Indians" is "the special object which we all have in view."

THE SOUTHERN INDIA CHAMBER OF COMMERCE.

THE Tenth Annual General Meeting of the Southern India Chamber of Commerce was held at the Indian Chamber Buildings, Madras on March 31. The Hon Dewan Bahadur P. Theagaraya Chetty, the President of the Chamber delivered an address in the course of which he said as follows:—

Diverse interests are coming into play and what is wanted on the part of an association like ours is a careful and close study of every problem with a broad mental outlook and a devotion to our true national interests. Our action to be really serviceable should be based on such a study. Here in this special field of our activities, there is no room for communal considerations, no narrow party interests to serve and no claims of costs or creed. We have no party politics to divide us. We have all of us who are carrying on trade and commerce, to work with one mind to pull together and advance our common cause, as best as we may. It is no easy task that lies before us. We have great obstacles in the path of our progress. We have powerful adverse interests to overcome, organised, intelligent and influential. Unless we are as well equipped as our rival organisations and can bring real business knowledge and capacity to bear on what we may attempt, we stand to lose eventually in the inevitable conflict. Let us, therefore, have a clear programme of work, an energetic propaganda and an efficient staff of workers amongst us.

Company Promotion

The Finance Member the other day, referred to company promotion in this Financial Statement, as an outstanding feature of the past year. During the eight months of April to November last, he said that 55 new Companies with an aggregate authorised capital of nearly 166½ crores have been registered in British India and Mysore. The latest figures are that for the ten months from April, 1919 to January, 1920, the number of companies registered was 721 with an aggregate authorised capital of over Rs 224 crores, the largest flotation in January being that of the Anglo-India and Colonial Navigation Co. Bombay, with a capital of Rs 10 crores. The question had been asked whether this spurt in company flotation is evidence of financial strength and a real for industrial expansion, or a morbid mania of the moment to be followed by crashes and crises in the share markets and

stock exchanges. Capital for a long time has been shy of investment in industrial undertakings in this country, and while we have to welcome heartily the present boom we have to be careful and cautious at the same time lest this phenomenal activity should shake credit and embarrass banking in the country. In a recent communication to us which will come up for early consideration by the Committee whom you are going to elect to-day the Government have asked for an expression of our opinion on a proposal to impose an *ad valorem* duty of one quarter per cent on the nominal capital of all Companies registered under the Indian Companies Act, in addition to the Stamp and Registration Fees payable there under. In justification of this step it is said that the number of bona fide companies and companies with excessive nominal capital is tending to increase, that imposing figures of nominal capital will induce the unwary public to believe that the strength and importance of the company are far greater than they actually are, and that it is time to protect the ignorant investor. On the other hand legitimate enterprise and the growing habit of investment have to be fostered. The question is as to how to differentiate between the sound and unsound commercial flotations. It seems to me there are other ways of checking the unhealthy growth than the one of additional taxation, but I shall leave to the new Committee to express its opinion on the proposal instead of trying to influence its judgment at this stage. At the same time, I am anxious that the tendency to gamble in shares to inflate their values at the whim of brokers and jobbers, and to stimulate reckless speculation in share transactions should find no favour and should be checked by all available means. Company promotion has become a pleasant pastime. It should not be so.

Labour Troubles

A serious menace to our industrial and commercial life at present is the epidemic of strikes and lock outs. These have become events of every day occurrence. Labour has its own difficulties and the conditions of workmen urgently need amelioration. Provision of education, improvement of housing conditions, sanitation, hours of labour, and general welfare work all demand attention. A general policy of betterment of labour cannot possibly be initiated all at once, nor can capital adjust itself suddenly to all the demands

that may be made upon it at a stroke. A steady process of constructive work and organization will have to be undertaken. But it is no use forcing the peace, for when once capital is disorganised by blind obstruction and mad hostility, the employees will find themselves in greater misery than they are in at present. Capital and labour cannot live independent of each other and they are the true friends of both who strive to bring about their co-operation. Quite a disturbing element in our local industrial life is the exploitation of labour by outsiders for their own ends. The so-called leaders of these labour movements, often self-elected and invariably unconnected with those whom they seek to lead, cause an amount of harm to the very cause which they want to advance, by their ignorance and prejudice. Personally I have more faith in the workmen than in their present leaders. I would appeal to all workmen to have their own meetings, to discuss their own affairs with their own robust commonsense and to follow the lead of their own chosen men, who work with them and who suffer with them than be led by mere exploiters who are bent only on creating scare or sensation. They can never hope to better conditions so long as they are under bad leadership. I trust the good sense of the labourer will soon assert itself and that the present day leaders will soon find their occupation gone. No employer of labour has any right to appropriate huge profits to himself or to pay large dividends, while the labour which helps to carry on a profitable industry is under-paid if not starved. The days of selfish captains of industry are gone. But at the same time the difficulties of labour can only be met satisfactorily by a spirit of mutual good-will and a desire to arrive at decisions for mutual benefit.

High Prices

But the problem of the moment is the problem of high prices. It looks as though high prices have come to stay. There seems to be no prospect, at all events, of the level of prices coming down to anything like the old standards. It may be that the rise of prices in India has not been so great, as the rise in the United Kingdom or in some of the European countries. But there has undeniably been a great increase in all prices in India in the last few years. The upward movement was noticeable even before the war. But the war greatly increased its rapidity. The world shortage of the necessities of life and the huge inflation of European currencies reacted in due course on this country. In India, we had the huge failure of the monsoon of 1918-19, which resulted in an enormous contraction

of our food crops. We have been also suffering in this country from currency inflation. To finance war expenditure in this country currency notes have been freely issued against British Treasury Bills and our currency has been heavily watered down. Owing to the shortage of the rolling stock on the railways, even the reduced supplies of foodstuffs could not be properly distributed. The profiteer was abroad and not all the measures adopted for the conservation and distribution of supplies by means of the control system have been really beneficial to us. In some cases the remedy proved worse than the disease. It came to be asked which was the greater evil control or profiting. The Smith Currency Committee observe that the rise in prices in India has reached a point at which it is injurious to the country as a whole. In a special memorandum submitted by the Government of India to that Committee it is stated that the effect of high prices has of course been felt most directly by the poorer classes, but it has reacted on all sections of the community. The Government of India observe that there is no longer any room for doubt that the resultant increase in the expense of living due to the high prices of food grains, as also of other necessities such as cloth, kerosine oil, and the hardships which this increase has entailed on the poorer classes and those on fixed incomes have been a very important factor in promoting unrest and discontent. The labour troubles you see around you every day are after all only the adjustment of wages to high prices. The clerical and other classes of employees are equally clamorous, and again the adjustment has to be made between their fixed incomes and higher prices. This process is a troublesome one and has to be gone through. While thus the effect of high prices on the main classes of population has been such as to cause misery to thousands of consumers, it has been argued that in view of our large export trade we stand to gain from higher prices abroad for our products in great demand in those countries. It was contended the other day that if there was a permanent rise in the value of India's products without a corresponding increase in the cost of her imports the future may be regarded as hopeful. Apart from all these theoretical considerations, the present high prices are unquestionably an evil and a danger to the country as a whole. It is impossible to predict the future course of prices. The condition of Europe at present is alarming in the extreme and until peace, order and good Government are established in the disturbed parts of the world, and production of an adequate scale to feed and comfort the world's population is ensured the desired economy

equilibrium cannot be reached. It will be a long time before this is reached and the suffering on account of high prices in the meantime will in all likelihood be an intense and prolonged one.

The Indian Fiscal Issue

You will remember that the consideration of the Indian fiscal problem was deliberately ruled out of the scope of the enquiry of the Indian Industrial Commission. The object of doing so was admittedly to give this important matter separate consideration. Besides it was impossible at the time to take up this question independent of the policy which the Government of Great Britain might determine for the United Kingdom or the self governing members of the Empire might settle for themselves. You will remember also that we have been all along urging the grant of fiscal autonomy for this country in any scheme of constitutional reforms that may be adopted for the better government of this country. During the course of the year in his Despatch on the Report of the Indian Industrial Commission in September last, the Secretary of State for India said that he was not prepared to make any pronouncement on the Indian fiscal question until the representatives of the people had an opportunity to express their views. He was confident, at the same time, that in the discussion of this question which must take place in India, the interests of the Empire as a whole would receive due consideration. Since then, we have had the report and recommendation of the Joint Select Committee on the Government of India Bill.

That practically settles the question of fiscal autonomy for us. It indicates the limitations to our autonomy. I do not quarrel with that. It therefore remains for us now to determine the right fiscal policy for ourselves. This is an issue which the reformed Indian Legislative Assembly and the Council of State may have to discuss, in the interests of India as a whole in early session of those bodies. This is an issue for which political parties in this country may sharply divide. Indeed the fiscal issue is a live issue already. The question is, what policy is right in the interests of this vast country, policy of Free Trade or Protection, or Fair Trade or

Imperial Preference, or Retaliation, or whatever policy is or may hereafter become current. There are numerous considerations involved in the settlement of such a policy for us. I hope the Committee appointed the other day by the Imperial Legislative Council, to examine trade statistics and to consider and report whether or not it is advisable to apply to the Indian Customs Tariff a system of preference in favour of goods of Empire origin and as to the best methods of considering the future fiscal policy of India, will do all the spade work and clear the ground, and prepare enough materials to enable the representatives of the people to form correct judgments and draw proper conclusions, when the time comes, and determine the fiscal policy for this country. In the meantime, it looks as though the thin end of the wedge is sought to be introduced in favour of Imperial Preference. We are told that the principle of Imperial Preference has been recently adopted in the tariff of the United Kingdom and in the tariffs of several of the Dominions, and that the question has consequently become one of practical politics for India. Our tea, tobacco and coffee are all given a preference of entry into the United Kingdom. We are also now giving a preference to the United Kingdom and the other parts of the Empire in respect of our own exports duty on hides and skins. Recently, this question of Imperial Preference was considered by the Indian Industrial and Commercial Congress at Bombay. The Association of Indian Chambers of Commerce, whose representatives then met, strongly disapproved of this policy of Imperial Preference and urged that no measure of Imperial Preference should be adopted till the whole question had been examined by a Committee fully representative of the various Commercial interests of this country and until the Indian Legislature is in the position of deciding for itself the fiscal policy best suited to the interests of the country and carrying it into effect. Under these circumstances, you can realise the importance of the question and the need for its careful consideration. I would suggest that such of our members who are interested in this subject should make a special study of it from now in all its various aspects and enable this Chamber in time to express its views correctly and promptly.

At the conclusion of the address, the annual report and the annual accounts were adopted.

BUSINESS OPPORTUNITIES

At the request of numerous subscribers and admirers, "COMMERCE & INDUSTRIES" proposes to render service of a practical character by opening its columns to its readers, subscribers, advertisers and correspondents. Accordingly, a new section, "THE WORLD MARKET" is open to them in which inquiries from firms and individuals who propose to open or extend business are published. Further particulars are given elsewhere in this issue.

THE MADRAS STOCK EXCHANGE

HIS Excellency Lord Willingdon performed the opening ceremony of the Madras Stock Exchange on April, 7 in the presence of a distinguished gathering of Indian and European gentlemen. The Hon. Rao Saheb Muthiah Chetty, on behalf of the Directors said that it is the fundamental principle of economics that no goods can attain their full value unless there be a market for the same, and the demand and supply have sufficient scope to play their role. The more scientific the price and the nicer, easier and more accurate the making of it the better the bargain for both buyer and seller and for trade in general. This can only be secured by an organisation under one roof of as many dealers, both buyers and sellers as can be found.

Before such a market be needed there ought to be a sufficient number of dealers who need it for their dealings, in other words, a sufficient number to invest their money in stocks, shares and securities. I would take you to the history of last century when the necessity of such a market was not absolute and the gradual development of the same. Until the even of last century the trade and commerce of the country and of the Province in especial were monopolised by private enterprise, rich people thought private enterprise more profitable, whilst the middle or lower middle class knew not the economy of small savings and had no opportunities for better investment than hoarding or finding through money brokers at usurious rates. Today all this is changed. The business of money lending is getting very risky but debt is moving real and good securities get monies direct from Banks at reasonable rate of interest. Further, the principle of incorporation and business under limited liability is getting appreciated by the general public and people with small savings. This is why the investor with an idea to develop the trader with a business to expand, the pioneer with a country to explore and Government with a scheme to finance are eventually be taking themselves to Stock Exchanges in Bombay and Calcutta and the heavy flotations last year of both the sister Presidencies are in a large degree standing illustrations of the above theory. We too on this side since the last six months are getting alive to the sense of it as may be seen from the recent promotions of limited companies in the Madras Presidency.

Manufacture and trade with limited liability, have too their pitfalls and it is to avoid them that the Stock Exchange exists. It is the Stock Exchange which creates standards and defines the difference between good and

bad investments. The brokers make a special study of the securities, the management, the organization and other factors which play a prominent role in the success of Industry or Trade run on limited liability principle. They, so to say, specialise themselves in the art of judicious and profitable investment and protect and safeguard the interests of many people who either have no time to study their investments or others who have no brains for good investments. Gentlemen, another great service rendered by the Stock Exchange is the means it affords of readily transferring securities from hand to hand. To appreciate the importance of this fact you have but to think of the enormous difficulties and delays that attend the transfer of other forms of property that do not enjoy Exchange or market facilities. I need not state, for example, is one of the excellent forms of investments, it is transferrable as well in the ordinary course. But what will be the condition of the seller if he is in a hurry and wants to cash his estate at once. There being no organized market and no competitive bidding he is unable to gauge the possibilities of his Estate. In the urgency of the need, he may be misled by unscrupulous, or dishonest advisers and this risk increases in direct proportion to his remoteness from large market centres. The holder of securities quoted on Stock Exchange is in quite a different position. He is absolutely independent. Practically, he knows the price of his holding every hour of the day. He is exposed to no fraud tricks are not possible at all. He has positive assurance that in case of necessity, at a moment's notice he can obtain at the prevailing price the value in cash of every security which is quoted in the Stock Exchange. All the newspapers moreover publish untroussed prices for his benefit and these quotations are not a one man affair, but the combined judgments of hundreds of experts, bulls and bears, bankers and brokers, speculators, jobbers and dealers bidding and offering against such other by telegraph, telephone or post and recording the epitomised result of their bidding in the prices current on the Stock Exchange.

But the most important function of a Stock Exchange is the almost automatic method with which it draws the savings of capital and distributes it amongst profitable channels of industries and commerce. It proves to be a source of drawing the small savings of the people for profitable investments. Further it demarcates bad from good investments. The moment the management or

organization of any industry or trade begins to pay lesser dividends or profits is reflected upon the barometer of the Exchange. Hence it is that a Stock Exchange is described by an eminent English authority, as a business of businesses. It is the nerve centre of the politics and finances of Nations, because in this mere market all that makes history is focussed and finds immediate expression. It is worthily defined as the barometer of their prosperity and adversity, for a glance at the tone of this market, whose waves are more mercurial than those of any other mart, suffices to indicate their condition.

After thanking Mr C M Kothari for his valuable services in the matter, Mr Muthu Chetty requested His Excellency to open the Exchange. Lord Willingdon performed the function and in the course of a happy speech said as follows:

It will probably be said by some that I am assisting to dry in the promotion of a project which will encourage speculation and gambling amongst our people. My answer is that this is not the main purpose of any Stock Exchange but that in any country which is developing or has developed in its commercial and industrial life it is absolutely necessary that there should be established some centre some market where shares (like any other commodity in other markets) can be bought and sold, a market which by the rise and fall in share prices will be a barometer to the public of the value of any concern and owing to which capital may be less shy of appearing for investment in sound industrial concerns which are put on the market from time to time.

That is, I think as I have said, the main purpose of the existence of a Stock Exchange. While I freely admit that so long as human nature is what it is it will be impossible to prevent speculation in shares or indeed in any other commodity, it is my sincere hope that under the management of a Board of Directors all of whom, I feel sure recognise the responsible duty they have undertaken to-day all of whom I am glad to know are men of influence and authority in this city, rules may be framed of such a character that the difficulties which may arise will always be dealt with in a just and fair manner. You have this great advantage in starting your enterprise. Gentlemen, that you have the experience of other Stock Exchanges to guide you and will be able to avoid many pitfalls which you might otherwise have fallen into at the start.

Can there be any doubt that India stands in an extraordinarily favourable world position from a commercial and industrial point of view? The larger

number of European countries will take some time to recover from the ravages of the war. India, well as she has done her part, but for high prices, has had nothing to bear of the devastation and ruin that have overtaken other nations. We surely wish to make the most of our opportunities by encouraging and investing in sound ventures which will manufacture out raw products and will establish our position with regard to our finished products in the market of the world. I believe that India, let me add particularly the Madras Presidency is going to take full advantage of this opportunity, and it is for that reason that I gladly come here to-day to show my approval of the establishment of this Stock Exchange which is to my mind one of the essential features in any industrial advance.

Dealing with the question of labour Lord Willingdon referred to the action taken by his government during recent months in the matter of labour disputes and concluded his speech as follows:—

It is my confident belief that before long there will be a rapid development in commercial and industrial enterprise in this country, a consequent wider demand for labour which will become, I believe, increasingly organised and increasingly efficient. We are in this country in the early days of our development and my hope is that we shall profit by the mistakes which have arisen between Capital and Labour in some other highly developed countries and that we shall establish the principle of partnership rather than antagonism between these two great interests. (cheers) If Capital will realise the humanity of Labour and the fact that, if Labour takes its share in the building up of any great enterprise it should also share in its success then Capital can claim that loyal and constant co-operation from Labour which must produce harmonious working and good feeling in any industrial concern. (cheers) For seven years now I have urged in this country the cultivation of spirit of co-operation amongst us in all branches of our public life. In no branch is that spirit more necessary than between capital and labour to secure the welfare and prosperity of our Province in future years.

INDIAN TARIFFS AND BRITISH INTERESTS.

THAT repeated reference should be made to trade questions in the debates on the India Bill read a third time in the House of Commons (last December) and brought up for second reading in the House of Lords was natural and fitting. Before the war came Great Britain's share of the great and growing seaborne trade of India was two fifths and nearly 63 per cent of Indian purchases abroad were made from this country. Generally speaking, however, the House of Commons showed a due sense of proportion and a recognition of changed conditions in accepting by implication the conclusion of the Joint Select Committee that the time has come for India to have a substantial if guarded measure of fiscal freedom. Mr. R. Dinniss who has represented Oldham since 1911, and Mr. G. Stewart, the member for Warrall showed some apprehension lest the contemplated limitation of the interference of the Secretary of State when the Government of India and the Legislature are in agreement on questions of fiscal policy, should have the effect of injuring inter-Imperial trade. Mr. Dinniss described the manufacturers and merchants of India as protectionists and said he anticipated that the first Budget of the new Indian Legislature would not only continue to impose duties upon English imports, but might increase them to such an extent as seriously to cripple our trade with India. In course of time India might discriminate against us in favour of Japan whose trade with her has increased so enormously during the war. He argued with much force that the great work of Britain in India would be ill requited if the Indian Legislature used its new powers to discriminate against this country and to establish unrestricted duties.

Mr. MONAGHAN did not answer these criticisms in any detail, but pointed out as the Joint Select Committee did, that nothing would do us so much harm in our new task of leading India to ultimate self-government as the slightest suspicion of a desire to manipulate the tariffs of India in the interests of British trade. He said he placed reliance on the sense of the solidarity of the Empire, and reminded the House that Imperial goodwill has always been developed by mutual trust. It cannot be denied, however, that there is in India an extremist element, obsessed by a belief that British manufacturers and traders have injuriously exploited India in the past, who would be ready to seize any opportunity to injure British trade. They fail to realize the immense value to their country of British business enterprise, and that its results are among the main factors which render possible the present great advance towards self-government. But these considerations are not overlooked by many of the most influential and progressive of Indian

public men. It is a very long and improbable step between the anti-British spirit of some extremist sections and a vote of the new Indian Legislature in favour of any form of non Imperial preference. It is still less conceivable that the Viceroy's Executive Council would give to any proposal of the kind the concurrence which will be necessary for limiting by convention the SECRETARY OF STATE'S power of speaking with the authority of Parliament, the final words, even assuming this agreement to be reached Whitehall acceptance of such a plan would be inconsistent with the intentions of Parliament. The Joint Select Committee recommend that the intervention of the SECRETARY OF STATE should be limited to safeguarding the international obligations of the Empire or any fiscal arrangements within the Empire to which His Majesty's Government is a party. Obviously under this formula he would be justified in disallowing any proposal having the effect of placing the United Kingdom or other parts of the Empire at a disadvantage in comparison with non-British countries. Though a changed convention will grow up the power of disallowance in any such case remains unquestionable. As Mr. MONAGHAN pointed out all measures connected with fiscal questions will be Bills, and all Bills will have to receive the sanction of the Crown.

The new convention will be effective, not in the establishment of any external discrimination unfavourable to British commercial interests but in relation to Indian manufacturing industries which are held by the Legislature and the Government to require such support. As we pointed out a fortnight ago, each case of the kind has to be judged on its merits from the standpoint both of Indian and inter-Imperial interests. The Governor General-in-Council will have a special responsibility in respect to the latter, as the connecting link on the spot between India and the Empire of which even when the full day of full responsible Government is reached she is to be in the words of the preamble of the Bill an "integral part." Colonel Wedgwood, while asking for more definite fiscal autonomy for India expressed the hope that she would impose no protective tariffs, since they would work to the injury of the masses of India. This consideration will in itself be a safeguard against the crude Protectionism to which Indian politicians in their day of irresponsible criticism have leaned. It will be their bounden duty, as *The Times* pointed out the other day, to refrain from erecting tariffs detrimental to the interests of the myriads of Indian consumers. This duty will be stimulated by the prospect of a General Election every three years. (*The Times Trade Supplement*)

INDIAN INDUSTRIAL AND COMMERCIAL TRAINING.

Parents are generally perplexed as to what their young hopefuls will do after leaving school. Government and private services do not absorb the ever increasing number of our literate young people. A proportion of them is inclined to pursue an industrial or commercial career. For such of them suitable avenues do not exist. With the double purpose of providing opportunities for strong determined boys to receive training in glass, industry, flour milling, and stationer's business, it is proposed to take in paid apprentices on a two to three year course, leaving them the untrammelled option on completing their training and gaining their certificates, to stay on or to work wherever they may like and of setting an example to other factory owners to afford similar chances.

Glass Industry

Eight apprentices will be admitted into my glass works at Amballa city for training, as follows—

(1) Two will be admitted into the office to gain practical knowledge of the sale and purchase business of the industry as a whole. An apprentice will be paid Rs. 15 a month in the first, Rs. 25 a month in the 2nd year with free quarters in the factory. He will get 15 days leave in a year on full allowance, and nothing else.

(2) Two will be admitted to receive training at works managers under an extended course for three years, starting as firemen and ending as glass makers. An apprentice of this class will get Rs. 20 Rs. 25 and Rs. 30 a month in the first, second and third years for his training respectively. They will get free quarters in the factory and 15 days leave on full allowance and nothing else.

(3) Four apprentices will be trained as blowers. They will start as blowers' helpers, and will receive Rs. 15 a month during the 1st half year and Rs. 25 a month for the remaining half. If in the 2nd year an apprentice shows to have mastered blowing in the line turned at the factory, he will be paid at the rate of Rs. 50 a month, more up to Rs. 80 a month if particularly good at his handiwork. A fully trained blower may earn from Rs. 100 to 200 a month by job work. Blower apprentices will be allowed free quarters and 15 days leave during slack season on full allowance at the rate he may be getting at the time. Blowers under training at the Glass Works will be expected to fully obey the proprietor's or his glass expert's orders and to complete their full course of training, without which no certificate will be awarded,

and in all cases the proprietor's orders with respect to factory discipline and promotion from grade to grade will be final and binding.

Flour Milling

Four apprentices will be admitted into the Upper Indian Steam Flour Mills, Amballa cantt. One will be attached to the milling department passing out finally through the laboratory attached to the Mills. The second will be attached to the power house starting as a fireman and finishing up as an engine driver with a few months' training in the workshop after which he will be given a certificate for passing his Government examination at Lahore. And the remaining two will be trained in the office in the sale and purchase business. The first two courses will be extended to three years and other two to two years; apprentices for the first two courses will get from Rs. 15, Rs. 25 and Rs. 30 a month in the first, second and third years respectively, and those for commercial training will get Rs. 15 in the 1st year and Rs. 25 in the 2nd, after which their course will be completed and certificate awarded.

In all cases free quarters will be provided and 15 days' leave on full allowance granted.

Stationers Shops

Two apprentices will be admitted into this line for a term of two years on a monthly allowance of Rs. 15 in the first and Rs. 20 a month in the 2nd year with free bachelor's quarters in the vicinity 15 days leave in a year, on full allowance will be given.

General conditions

For Glass industry Matriculates with chemistry as one of the subjects they may desire will be given preference when they are suitable. Work Managers. An apprentice coming for training as a Miller should also know chemistry and be a Matriculate or have higher qualification. Other apprentices need only be Matriculates of the Punjab University. The first month for every apprentice will be without allowance. For further particulars please apply to—

(Proprietor, Upper India Glass Works, Amballa City)

—The Collegian

BRITISH INDUSTRIES FAIR AND EXPORT TRADE

Speaking at the British Industries Fair at the Crystal Palace, Sir Auckland Geddes, President of the Board of Trade, said that an opportunity had presented for buyers from all parts of the world to secure goods of any kind they wanted. Four travelling exhibitions of British goods are to be established for the British Dominions, the Far East, South America and the United States. He appeals to the British manufacturers and merchants to seriously consider, in their own interests, the great importance of supporting the development of such travelling exhibitions. The establishment of show rooms on the Continent of Europe and elsewhere is under the consideration of the Government.

"Such developments," said Sir Auckland, "are an index of a changing idea in regard to industry. In the past our manufacturers and our merchants have competed very severely with one another and have even through their competition one with another not helped British industry as they might. The only way we can win back to the commercial prosperity which we enjoyed before the war is through a great development of our export trade. The exchanges of the New World are at present against us and the only way in the long run that can permanently alter that position is if we should develop enormously the export trade of this country. (Hear, hear.) The Home Market is certainly profitable to-day but the Overseas Market will be profitable long after the Home Market has ceased to be so very attractive. And so I would ask you to recognize in the British Industries Fair a serious effort to develop our export trade."

Sir Auckland added that the Government wanted to contribute £100,000 to the guarantee fund of the British Empire Exhibition to be held in London two years hence.

British Industrial Assurance

The Departmental Committee appointed by the Board of Trade, London to inquire into the business

carried on by Industrial Assurance Companies and Collecting Societies urge that, in the public interest, there is need for many reforms and for increased Control and recommend that legislation should be undertaken without delay.

The Industrial Assurance system lends itself to abuse in many directions says the report. Despite the vigilance of the Registrar the public is defenceless against the machination of any group of adventurers who have neither money nor reputation to lose and whose single purpose is to exploit the system for their own benefit. As regards the formation of new Companies the position is less unsatisfactory, but even here there are cases of gross and reckless extravagance carried on under the forms of the law in which the Board of Trade has found itself helpless to give adequate protection to the insuring public. Apart from this class of cases the Committee find many examples of reprehensible extravagance. Further and largely as the result of this waste on premiums many Companies have found themselves after a long or shorter period involved financially beyond redemption. In a reference to the Post office insurance system the Committee state that as now administered it can only be described as a failure. On the question of nationalization of industrial assurance, the Committee state that there are two possible courses: the transfer of the whole organization to the State or the provision of burial benefits through the medium of the National Health Insurance system. On the question of lapses the Committee state that the matter which is the most frequent subject of complaint in regard to industrial assurance business is the excessive number of lapsed policies. The report contains proposals for the adoption of a statutory form of proposal with adequate safeguards if the form is filled up by an agent and standard forms of policies. Legislation is recommended to prevent serious abuses in the transfer of engagements of collecting societies.

RESTORATION OF MADRAS HARBOUR.

The outer end of the north cut sheltering breakwater of Madras Harbour was wrecked by a cyclone in November 1916 and it was subsequently decided to make a new outer bastion for it by sinking in the seabed a caisson well, with a sunk rivetment of rubble around it. Scarcity of timber compelled the strictest economy in making the numerous and varied block moulds an important saving being effected by making the larger blocks before the smaller ones, and by careful pre-casting in the block yard. The caisson for the permanent head will consist of an outer cylinder 48 ft in diameter and 50 ft high with a strong cutting edge. Within it, but only extending down to within 15 ft of the cutting edge, there will be an inner cylinder 18 ft in diameter. The lower edge of the latter is to be splayed out, by the usual cant plate to connect with the cutting edge of the outer cylinder. Both cylinders are to be

strongly braced together to resist water pressure. There will thus be a braced annular space of 14 ft 9 in between the two cylinders. The intention is to erect the lower part of the caisson on a shipway that has been prepared for it and then having equipped it with a false bottom to launch it in an available depth of 1½ ft of water. Hence it will be towed out stage by stage into deeper and deeper water concrete being deposited in the annular space at each stage, and more plate strakes added on top. Finally, when it has been sunk by concrete till it has no more than a safe free-board, it will be towed to site and sunk. Then, a light suspension bridge having been thrown across to it from the semi-permanent head, concrete will be deposited in the annular space. It is estimated that the cost of the permanent caisson-head will probably not exceed £43,000 (Sir Francis Spring *The Technical Review*.)

MR. BALFOUR ON RESEARCH

FOR INDUSTRIAL PROGRESS

Mr Balfour presided at a conference of representatives of research organizations connected with the Department of Scientific and Industrial Research, at the Institution of Civil Engineers, Great George Street, Westminster, the other day, when papers were read by Major H. J. W. Bliss (Director of Research of the British Research Association for the Woollen and Worsted Industries) on "Research Associations and Consulting Works, and the Collection and Indexing of Information," and by Mr W. Lawrence Ball (of the Lancashire Cotton Spinners' and Doublers' Association) on "The Equipment of Research Laboratories."

Mr BALFOUR said:—Scientific investigation in connexion with industry is a subject in which, if I may say so, he, egotistical I have always been deeply interested, and if anybody was ill advised enough to die into the shapeless mass of innumerable speeches which I have had to deliver on various occasions he would find a good many utterances upon this theme. Evidently as I think—and most of you think—the industrial progress of mankind is going to be in the near future more and more dependent upon the alliance of science and industry, and upon the co-operation of different branches of science with each other. I thought we do not always act upon that principle; it has almost become a commonplace in our public discussions, though I think we sometimes are apt to forget how recent the truism which I have just enunciated is, how recent is the recognition of that truism by the general public. I do not know that there has been any book written—if so I am not acquainted with it—on the history of the relation between pure science, pure investigation, undertaken for no other object than that of increasing our knowledge of natural law, the history of the relation between that subject of human effort and industrial production. As a matter of fact I believe it to be in bulk unquestionably most recent. I hesitate to conjecture, but, without investigation, and very likely with profound error as to the facts, I think that in the first of this fruitful alliance of science and practice was in connexion with, perhaps, the discovery of Gilbert in magnetism and probably in its application of theoretical optics to the telescope and the microscope. I am not going to attempt to deal without more knowledge or preparation than I can give to this subject with the history of it. Apart from detail, and apart from the minute accuracies of history, what I think is certainly true is this, that the great industrial development in which Great Britain led the way towards the end of the

18th century—which gave us a manufacturing supremacy over the world which it is certainly impossible, and probably not wholly desirable, that we should ever regain—that industrial development was not in the main due to anything which pure science contributed to industry, and I believe that it is partly owing to that that the great industrial community of this country, whose succession to their forefathers at the end of the 18th century and the beginning of the 19th century has not been interrupted have not got, as it were, into the groove of their thoughts the idea that science is now in these days an essential element in industrial progress.

THE GERMAN DEVELOPMENT

The Germans, whose industrial development came much later, have always taken a different view. I do not think that they have shown any greater aptitude for science than our own fellow countrymen, and I am sure they have shown no greater aptitude for industry, but beginning as they did rather late in the day, with their great powers of governmental organization, with their highly developed and equipped universities, and with the view which they have always entertained of the close alliance that ought to exist between knowledge and power, they naturally and easily did what we, with more difficulty and at a later date, are beginning to do. They marshalled they mobilized—to use a modern phrase—all the force of science in helping them to develop their great industrial efforts. We must not imitate them, but we must follow their example. They saw what, from the nature of the case, we could hardly be expected to see so soon—how close was the co-operation, how absolutely necessary it was not merely in the competition of people with people of industry with industry, and of one community with another community, but from the standpoint of crew—the point of view we ought to adopt if all nations were united in one great industrial community, the point of view which really depends upon the correlation of nature only upon our increasing knowledge of the power of nature that we can expect to improve the material life of man.

It is one of the many faults which Lord Bacon has to be a great prophet of the modern movement that he laid it down that experimental knowledge was to be undertaken in order to improve the unhappy lot of the human race, and that is what ought to be one of the great objects which we have in view. I am not suggesting, of course, that mere material progress is all progress. I am not suggesting that either prosperity in

trade or the cheapening of manufactures is going to be the great regenerative of mankind. I accept the view that "man does not live by bread alone." But if you wish to improve the material lot of man and surely that is worth while, it can only be not by quarrelling over the manner in which profits are to be distributed or by any of the controversies which divide various interests and countries, it can only be by the means though they are subject we cannot avoid the thing which is really coming to make a difference in the future to make the remainder of the 20th century different from the 19th century, and the 21st century different from the 20th is the command, for industrial progress which man has over the forces of nature. It can only be attained in the first place by the cultivation of pure science, of science for itself of knowledge for its own sake. It can only be attained if we have to breed and to educate men who without any thought of self advancement are consumed by a curiosity to know and to find out. Having been attained, then, to learn how to apply the knowledge which they have themselves acquired to the great purposes of industry and development. Looking broadly looking at the material progress of mankind as it is we can venture to say probably that and that almost done is coming to the hands of men of human advice.

They had come there that they continued Mr. Balfour, because they realised broadly speaking that they must bring knowledge to their country in the organisation of the force of science. They realised that they had to make calls, not on science alone but on various sciences working together, and they realised that they had to employ them in their practical endeavours in which they were concerned and because they believed as he most relevantly believed, that unless they wished to suffer from disastrous overlapping, unless they wished to lose all the advantages which inter-communication between persons similarly engaged produced, and had always produced in the history of the world it was necessary that they should meet together, from time to time and interchange ideas, and make themselves acquainted each in his own industry

with what was being done by others carrying on similar efforts in similar ways and because they believed that by that means and that means alone, could they really extract all that could be extracted from our rapidly growing knowledge of the forces of nature. He believed they would spend a most profitable afternoon by hearing the papers which were to be read. (Cheers)

FRATERNITY OF TRADE SECRETS

Major BRISS in his paper gave a brief account of the causes that were leading to certain developments of the work of the British Association for the Woollen and Worsted Industries. He referred to the desirability of a consulting department. In the woollen industry there were many firms which had never made a practice in the past of employing a consultant. The reason often was that they had believed they had methods secret to themselves which they were afraid of letting out for fear that the knowledge might be put out to rival. Dealing with the information he had heard that with regard to textile trade the amount of work to be done was appalling, and overlapping of investigation and overlooking of old work were called for at the time to come. With regard to the purposes the abstracts and indices which related to the textile industries were valuable to their Association but the others had not been prepared from their point of view so that many matters that might be of interest to the textile trade seemed to escape notice or prominence. In dealing thanks to the work of the Society of Dyers and Colourists matters were better, and the Textile Institute was making effort to meet the need for the future in the systematic abstraction of relevant literature and patents outside dyeing. So far as one could find at an early stage the system of his Association was standing, the test of experience, and the index would become rapidly and increasingly more valuable as additional workers were available.

Mr. BATES dealing with equipment of research laboratories, said that he did not believe in starting research laboratories according to a pre-arranged plan. He advocated the completest possible elasticity of design in provision for experimental work. The plea was relevant even in pure science.—(Times)

PROGRESS OF SCIENCE AND RESEARCH.

Glass and Cement

During the war the optical and glassware department of the Ministry of Munitions began an organisation partly designed to help manufacturers in developing the possibilities of the industry and the Research Association is the outcome of it. The association has found it necessary to go to America for its director and this is not without its advantages. The American glass industry has a long lead on the British and first-hand knowledge of its points of superiority will it is hoped save the association time and money. Six committees, consisting of the best brains of the industry, have already been at work considering problems with a view to mapping out definite lines of research for an director and his staff to follow. Their respective fields of work are: (1) Chemical and physical properties of glass at all temperatures; (2) fuel, refractive and funicular; (3) the making materials from the industrial point of view and improvement, and finishing operations; (4) the making machinery; (5) lamp working, boiler and lay-out of factories and equipment.

The London Portland Cement Association has another advantage. It has previously been a non-being, carried on under the aegis of the Department. The chemistry of Portland cement is not as yet an almost unexplored field. It is such a job by certain manufacturers in the cement industry that progress for five years but the work has been taken over by the new association. Staff and laboratory accommodation have been arranged and the programme of research has begun. Last the improvement in recent manufacture in regard to cost of production and quality of the product.

Ghosh's Law in Chemistry

Sir P. C. Ray introduced by a representative of *Amrita Bazar Patrika* and sat close upon the stage. He had occasion to say that one of the most remarkable papers of that year was that of Mr. C. Ghosh. It was a contribution which marked a new era in the subject viz. the Abnormality of Strong Electrolytes. His contribution has now received a measure of praise in the highest scientific circles and that Ghosh's Dilution Law occupied a conspicuous place in the discussion on "the present position of the theory of Ionisation" at a special meeting of the Faraday Society. Dr. H. J. S. Sand, an eminent authority observed that "Ghosh's theory would rank as the most important advance in the theory of Electrolytic conduction since

enunciation of the Ostwald-Planck dilution law." But the most authoritative imprimatur which Ghosh's law has received came from Prof. James Walker who is regarded as being the pioneer in popularising physical Chemistry in England. In the latest edition of his text book he says that "Empirical formulae may now be discarded in favour of Ghosh's and again the most successful of these formulae is that put forward by Dr. J. C. Ghosh." Sir P. C. Ray commended said that thirty-five years ago while a student at Edinburgh he dreamt a dream that God willing a time would come when his countrymen would be able to add to the stock of world's knowledge by original investigations. That dream was on the eve of materialisation. When he looked into the transaction of the Faraday Society and Walker's Physical Chemistry and was thus assured of the recognition of Ghosh's law he considered the moment as the proudest in his life.

The Movement of Plants

In the March number of *The Modern Review* there is reproduced a contribution by Mr. Edmund Peiver to the *Puritan paper The Lamp* under the above heading. We take the following extract from it:

The main difference between animal and plants lies in the fact that the elements of the latter enclose themselves in a firm sheath or formed in a protecting envelope composed of an inert substance sufficiently so to prevent any external chemical force under external pressure. The substance known to us under the name of cellulose is nothing more than the material of which paper is made. It is the formation of the wall of cellulose in plant cells which enable plants to appear as rigid bodies from above them. Their contractile mobility is purely a mobility of a merely relative and a natural kind. Calcutta, Sir Jagadish Chandra Bose, a Cambridge student in London by education, who has observed the movement of plant and animal cells and divided them into motion. It seemed to me that Sir Jagadish had that the mysterious and hidden world of life which he was making me attempt to penetrate into the mystery of them and the movement has naturally caused them rather than. If he were to tell the details of the growth of a plant before the extremity of it from a very little distance, he would show a movement which is now not to be made, provided with a little brightly illuminated light. As to the idea of fixing to the extremity of a plant, to a light wand whose free extremity should render visible the minute motions of it but by amplifying them the credit for inventing this belongs to Darwin who has in fact described the movement of a growing plant. The merit of Sir Jagadish's contribution is in having modified this procedure of research in such a way as to make the results apparent to a large audience. It is a fact that no one can fail to feel surprised when one sees the extremely slow motions of plants so magnified as to resemble the brisk movements of animals.

SOCIAL AND ECONOMIC RE-STATEMENTS.

THE CREATION OF WEALTH

SO far attention has been directed chiefly to that common foundation of social welfare the public security. Not understanding the true cause of popular unrest — the getting rid finally of the tradition of servitude — taking this unrest to be a sign of danger though in fact it is a symptom of spiritual death, our rulers instead of addressing themselves to the reform of Government on representative lines, have set out to entrench themselves against change on lines which have proved historically to be vicious, and can only plunge administration yet more deeply into the morass of extravagance. In doing so they inflame the very danger they seek to avoid.

Now if public insecurity be a clog upon production, and admittedly it is, if the effort to undermine and whittle away free government leads on the one hand to suspicion and industrial outbreaks, and on the other to hesitation and enterprise, then this failure in public trust is a bad impediment to national recovery.

There may be doubt on the point. The doubt will be dispelled by considering the sources of national prosperity.

Production, the source of national wealth, takes broadly four forms. There is first the production of food-stuffs. When the cultivator tills his fields, sows them, and reaps his harvest, he turns to account the organic energy of nature. He assists and intensifies it. He creates wealth, represented, let us say, by the difference between a bagful of good corn and a barrelful of grain.

Next there is the production of materials. Coal, iron, lime or clay have only a potential value until dug out. Their actual value is the wealth created in the process.

Thirdly, there is the working up of materials. In the process of manufacture raw cotton for example, may in value become fifty times what it was weight for weight, for it may be worked up into a mercerised fabric nearly as strong and as fine as silk. And iron may in a great variety of forms be worked up into steel products some of them five hundred times the value of the original material weight for weight. Potter's clay in like manner, becomes fine porcelain, timber furniture and fittings. The difference is created wealth.

Fourthly, there is transport. Materials and commodities have a higher value in one place than in another. The difference is realised by their removal, defraying the cost, and the profits of adventure. The difference is a creation of wealth—utility estimated in terms of money.

These are the sources of the public income. Upon the third and fourth more especially invention has had a far-reaching effect. Upon the third the influence of science and machinery has been revolutionary. But in that connection two points are often overlooked. The first is that there cannot be an increase in manufacture without a corresponding increase in the demand for materials. Number three, therefore, has reacted on number two. And there could not be this increase both in manufacture and in the production of materials without a great increase of employment. Numbers three and two in that manner react upon number one. The second point is that manufactures the production of materials and population could not be thus expanded without expansion of transport on a like scale. And all this could not have taken place without acceleration of transport. *In a word the whole working structure hangs together.* We have to remember that steam power not merely trebled the carrying capacity of the British merchant navy by saving time but that it stimulated the growth of the merchant navy. The efficiency of the merchant navy is the country's very life. The value to us of the command of the sea is not merely the freight earned by carrying for foreign nations, and the freight earned in carrying for ourselves, it is the influence of sea transport on manufacture on mining, and on cultivation. *The fortune of Great Britain is based upon the sea.*

Why did modern manufacture take a lead in this country rather than in any other? For two reasons. First, the sea gave far greater facilities for world transport, it is the only means of world transport. Secondly, whatever its shortcomings, the government of this country, based on the representative principle was at any rate better than any other in Europe. There was greater security.

Now rationally and socially it is the duty of the Government to assist the nation in its production of wealth. But what despite all the talk, do we find the executive doing? 'Controlling' and impeding sea transport, and what is more, threatening still to impede it. On the one hand they call for increased production, on the other they incur and inflict losses running into millions through delays to shipping. This is their notion of administration; the old, sad story. Does it assist the creation of wealth to vitiate representative government, and have ten tax-gatherers where there was one before? Manifestly not.

The moment the work of the world is considered it becomes too clear for dispute that creation of wealth arises from the power of mind. It is a conquest of the forces and resources of nature by human ingenuity. But when that is said the measure of the conquest is seen at once to be the measure of the ingenuity. *The boundaries of subsistence are in the mind of man.* Knowledge is both the fountain of riches and the secret of power. Not one hundredth part of the potential natural wealth of this planet has so far been tapped for the supply of human needs. Yet, in the face of these to all intents boundless riches, Governments, which should assist in the creation of wealth, have fought and squabbled and destroyed lest some should have more of the paltry realised fraction than others.

Knowledge is applied productively in method. Co-operation of man with man springs from the search for better method. Invention, summed up, is the application of better method. Enterprise is in easier and readier way of getting things done. The motive is a fuller reward, the fuller reward the outcome of saving—economy. In the pursuit of better method—the economy of effort—industry divides and subdivides, and specialisation is carried to a finer point.

And commerce, from the same driving impulse of economy—reduction of costs and increase of profits—is constantly seeking out facilities. The driving impulse has brought forth modern means of transport for in transport the creation of wealth is essentially the saving of time. Further, both on account of time saving and security, the driving impulse has called into being the world wide structure of banking and credit is the world-wide medium of exchange.

This is the brighter side of the picture. Unhappily there is a darker side. These great and beneficial changes have had to fight their way against a legacy of errors. The spread of knowledge has been obstructed

by contempt and class prejudice, and the power of mind, unvalued left to run largely to waste. Instead of seeing that co-operation is natural and necessary, and must become more intricate and complete as civilisation rises, theorists, failing to perceive that in the conquest of nature men advance as organic hosts or communities, have made them out to be independent and contending atoms. The truth about competition and all it means is that co-operation and exchange should be free; that freedom is the life of industry and enterprise. But to claim so much—a necessary claim—is very different from ignoring the truth that men economically are a brotherhood. The jealousy of individuals fostered by this falsehood, has inevitably spread into the jealousy of nations.

The plain every-day truth that supply stimulates and governs demand, just as much as demand stimulates and governs supply, though a truth which every body every-where acts upon is not taken into account. *The truth is the open secret of fortunes; enterprise everywhere relies upon it.* Nevertheless the would-be monopolist is for ever haunted by the fear of producing too much lest prices should go down. All experience proves that prices never go down unless the total of earnings and profits at the same time gone up. The world in which the consumer reaps all the benefit of increased production and the producer none is a book made and phantom world.

Does it assist production to maintain and truckle to monopoly and share in the "excess" proceeds? As you cannot truckle to monopoly without strangling enterprise it is clear that this mode of raising revenue involves a double impoverishment. Does it assist the creation of wealth to spend the public money in defence of helotry, though by the greatest captains of industry the system stands condemned? Again, manifestly not. Neither, then, in safeguarding common security nor in aiding the production of wealth have our rulers so far been acting up to their public trust. —*Westminster Gazette*

GERMANY MAKING BID FOR DYESTUFF TRADE

Japan's Fear of German and British Competition

The dye-stuff market is exceedingly dull and inactive due to buyers' hesitation in purchasing. German manufacturers are now making bids for the Japanese market together with British manufacturers, and although their supply is still too small to be a scare holders are nervous. Consumers, too, have grown timid as they think further importation will force down the price here.

The slumps repeated since the middle of March in the stock market and several other lines have already caused much uneasiness in business circles and in the different lines men are mutually suspicious about each other's credit. In the textile trades this uneasiness is accentuated by bankers' flat refusal to advance new loans. This is in its turn affecting the dye-stuff market.

Provincial textile manufacturers are trying to refrain from covering their needs as much as possible and are placing very few orders with dye importers and manufacturers.

A prominent dye importer said that this adverse tendency was much accentuated by the resumed importation of German dyes and the fresh arrival of British colors. "The arrival of British colors is not very large although it is magnified very much by rumor-mongers in the market," said the importer. "British manufacturers may be endeavoring to establish their market in Japan, but they are believed by Japanese importers to have not much cargo to spare. German manufacturers have, on the other hand, started an active bid for the market here and their goods are now actually in the market. However, the arrivals so far are small. I do not expect, in view of the condition of Germany at present, that German manufacturers will

be able to maintain even this poor supply regularly. Therefore, is it too premature to anticipate any radical change in the dye market here on that score. But consumers believe otherwise and put off their purchase."

Under these conditions the price is rather unsteady, but because of the comparatively small supply from the United States on which Japan is still mainly dependent it is not marked with any decisive tendency to fall away. Rodamine B extra is still quoted at Y70 per kin. Mixed red is quoted at Y4 per kin. Acid green is offered at Y15 per kin. Patent blue N is quoted at Y130 per kin. Orange A conc is quoted at Y450 per kin. Benz/o fast orange is quoted at Y60 per kin.

Direct black methyl violet, and some allied colors which are manufactured in Japan and exported are very active in contrast to the other kinds of color, because China is now actively buying those colors.

(—*Japan Advertiser*)

TRADE WITH GERMANY

Advocated in France

The question whether or not French industry, commerce, and finance should resume business relations with Germany has lately been discussed in the French Press. Some hold that it is unpleasant from the point of view of national sentiment to enter into friendly dealings with the late enemy, but the absolute necessity of commercial arrangements with Germany is strongly expressed here in influential quarters. One authority says that a prejudiced opinion has spread abroad against German merchandise on the plea that what Germany always sells abroad is cheap and rusty stuff fit for dumping. The facts are otherwise. A great variety of goods is now wanting in France, because these categories of wares cannot be produced at home in sufficient quantities, or else their manufacture is no longer possible, whereas these descriptions of goods are plentiful beyond the Rhine. It is urged that the Allies of France can furnish the merchandise wanting, and that it is improper not to apply to friend and to favour their economic recovery rather than help the Germans.

But the fluctuations of exchange are used as the chief argument and they come into play with peculiar force at this moment. A French franc is worth the value of three francs in Germany whereas the exchange rate of French standard money falls short by one half of its free value in the United States. Thus goods bought by France in Germany cost six times less than in America.

Economists also insist on the fact that the the resumption of trade with Germany will be one of the principal factors to reduce the cost of living. M. Paul Bignon, French Commissary General in Great Britain says "We are spectators in France of this strange spectacle, that the Americans and the British are selling to France—at what prices—merchandise made in Germany!" The Chambers of Commerce of France seem to begin to take the same view for the president of the Chamber of Commerce of Lyons echoes the opinions of his colleagues, as well as his own that notwithstanding questions of sentiment trade should have been resumed with Germany the instant the Peace Treaty had been ratified.—*The Daily Telegraph*

Hookworm Disease A small leaflet issued by the Publicity Bureau states that this disease is widely and heavily spread. As a result of an investigation at Nagapattam in which 10,000 persons were examined it was found that 98 per cent were infected. It causes mental deficiency, physical decay, poverty and economic inefficiency, sterility, impotence and reduced frequency of conception. It retards mental development in children. After treatment, marked gains in weight, and physical appearance and mental progress will be noticed. Those who are interested in checking the growth of this disease are advised to address the Surgeon-General with the Government of Madras.

COMMERCIAL LAW CASES.

Director's disqualification to be an officer

An action of interest to company directors came before Mr Justice Shearman. A limited company claimed the repayment of £132 with interest at 5 per cent from a man who had acted as Managing Director of the firm. A resolution was passed at a Board meeting, purporting to appoint the defendant Managing Director upon his acquiring the necessary share qualification and declaring that the appointment should be confirmed and the salary was 'to be left to a later date. It was argued for the plaintiffs that it was not within the powers of the directors to appoint him and that the chairman, without the knowledge of the other directors paid to the defendant salary and expenses. Counsel for the defendant contended that as the money had been paid to him as an officer of the company it was irrecoverable. His Lordship in giving judgment for the plaintiff Company, said that it was well settled law that if a man obtained money under colour of an office to which he had no right the company could recover that money.

Insurance of enemy goods

Before Mr Justice Rowlatt came an unusual point on a claim for a loss under a policy of marine insurance dated July 19, 1914. The policy, which was issued in Sydney, insured the Electrolytic Smelting Company of Australia against the loss of copper ingots to be shipped from Sydney to London and there transhipped for Hamburg. The bills of lading made the copper deliverable to the smelting company or its order. The plaintiffs in the action—the Bank of New South Wales in pursuance of an agreement with Aron Hirsch and Sohn of Germany paid the invoice price of the copper to an agent of that firm and they were to be repaid in London on the due date. They were not paid by Hirsch and Sohn. The copper was seized by the customs authorities in London and was eventually condemned as prize. It was contended for the plaintiffs that the policy sued upon did not deal with a German insurable interest, and they were not merely the assignees of Hirsch and Sohn. In dismissing the action with costs, Mr Justice Rowlatt said that the policy was simply a policy on the goods of Hirsch and Sohn. The pledging of it with the plaintiffs could not alter the rights conferred by it. Thus the plaintiffs had only stepped into the shoes of Hirsch and had no more than Hirsch's rights.

Liability for keeping dangerous substance.

The action arose out of an explosion of dinitrophenol an ingredient in the manufacture of picric acid which occurred during a fire at the works of the defendant company, the Rainham Chemical Works limited. The fire damaged the premises of the two plaintiff companies and they claimed damages. Lord Justice Scrutton had held that the defendants were liable on the principle laid down in *Hetcher v Rylands* that he who brings a dangerous substance on his land must keep it within bounds. On appeal the defendants took the point that they were merely working under the instructions of the Ministry of Munitions, that a Government Department and its agents were protected from liability, and that the doctrine in *Hetcher v Rylands* did not apply where the land was properly used for the benefit of the community and the defence of the realm. The court of appeal dismissed the appeal. The Master of the Rolls in his judgment pointed out that on the authorities cited liability existed whether the land was or was not owned by the person who was responsible for bringing the dangerous substance on it, and whether that person was or was not aware of the danger at the time when he brought the substance there. Lord Justice Gouger thought that the responsibility of the appellants was technical only.

Contract of Indemnity

Before Mr Justice Sargant, the liquidator of the plaintiff company, which had sold its undertaking to the defendant company, made a claim for interest on debts which had been paid by the plaintiff company. There was an agreement between the plaintiffs and the defendants under which it was provided that, as part of the consideration for sale, the purchasing company should discharge all the debts of the vendor company. The defendant company found that it had taken over greater liabilities than it could bear and the plaintiff company paid large sums on liabilities which the defendant company ought to have paid. Meanwhile the plaintiff company had begun an action for specific performance of the agreement, which ended in its favour. The judgment in the action was affirmed both by the Court of Appeal and the House of Lords. The Judge decided that the purchasing company was liable to pay interest, but as the vendor company had not claimed interest it was precluded by the previous judgment from doing so.

A Delivery Note

Before Mr Justice Darling, the plaintiff's claim was for the price of a quantity of flour which they said was sold and delivered to the defendant. The flour was lying at the Victoria Docks where the defendant sent for it. Owing to some mistake he failed to get it, and he wrote to the plaintiffs enclosing the delivery order and cancelling the contract. A ledger clerk at the docks had marked the order "comply". The plaintiffs contended that in these circumstances the property in the goods had passed to the defendant. His lordship declined to take that view. He said that although the writing of the word "comply" on the delivery order was an authority to hand the goods over, it did not amount either to actual or constructive delivery.

Sub-underwriting Contract

The Sub underwriting contract was the printed form of letter which is commonly used. The capital of the company was to be £ 400 000 divided into, £ shares, of which 350 000 were to be offered for public

subscription immediately after incorporation. The Trust agreed to advance the £ 20,000 required to be deposited on the registration of the company, to underwrite £150 000 of the 350,000 shares, and to pay preliminary expenses to the time of allotment. The plaintiff signed the sub-underwriting letter and handed it to the Trust with a cheque but he did not sign any application to the company for shares. The Trust applied for allotment and paid the amount of the plaintiff's cheque to the company. Thereupon shares were allotted and the plaintiff's name was entered on the register of the company. The plaintiff said that his solicitors had written a withdrawal of the application before he received notice of allotment and that therefore there was no contract to take the shares. His lordship held that the sub-underwriting contract made by the plaintiff was made for valuable consideration and was irrevocable. He said that it conferred authority not only for the making of the application but for the maintenance of the application as an effectual application down to the date of its final acceptance by the company.

NOTES FROM JAPAN.

Increase Production

Referring to the wastefulness of war and to the serious difficulties under which Europe is labouring, the *Yorodsu* emphasises the need of encouraging and increasing production. At the present moment the only means to promote the happiness of mankind is to increase production. Increased productivity is all important to the world, but the labourers are demanding a larger share of industrial products in return for reduced services. This tendency is discernible even in Japan.

A Labour Commission

The Government has created, says the *Osaka Asahi*, a Provincial Industrial Investigation Commission, the function of which is to investigate and consider important industrial affairs that may be referred to it by the Premier. The members include the labour delegates who represented Japan at the Washington Conference. The paper says that these institutions are only intended to shift the responsibility of the Government. It warns the Government against trying to suppress labour movements by force or the display of authority, and advises the authorities fundamentally to change their attitude towards the issues of labour.

The Price of Silver

The *Tokyo Asahi* says that the reduction of percentage of silver in coins may slightly decrease the demand for the metal for coinage purposes but it does not think that it will cause a decline in the price of silver. Unless speculation in China and India is ended, it will even be impossible to meet the coinage requirements of Europe, failing a substantial increase in output which is not likely. The centre of the world's silver market is changing to New York. If New York maintains its present position for the next three years, the actual control of the world's silver market will not return to London. It is an undeniable fact, says the paper, that exchange rates are now based not on the standard quotations in London, but on the actual market rates, and this may be taken as one of the evidences that Great Britain is losing her economic authority in the world.

Trade and Prices

In the first half of last year, says the *Jiji*, imports showed a great excess over exports but this was reduced by the increase in exports in the 'second half-year', which was largely due to economic prosperity in America. Similar prosperity cannot be expected this year and there are unmistakable signs of a decline in American exports owing to the suspension of economic aid to

Europe Merchants and manufacturers in America are generally following a retrenchment policy and it is clear that the American demand for raw silk and other Japanese merchandise will suffer a great falling off. On the other hand, Great Britain and other industrial Countries are arranging to recover their markets in the Orient, and as a result Japanese trade in that part of the world will suffer considerably. As a matter of fact the sugar industry of this country has already been affected. Another important factor is the rise in prices in this Country. Now that the world's trade is reverting to normal conditions it is natural that Japan, where prices are the highest in the world should turn into an importing nation. The increase in imports into this country owing to the circumstances mentioned will have the effect of decreasing currency and of lowering prices. In the interest of the people therefore the paper welcomes the excess of imports.

Fibre in Japan

Japan has discovered a new fibre to mix with cotton, which promises to cause a revolution in cheap

fabrics in the far East. It is a kind of sea grass known as sugamo which when properly treated and mixed with raw cotton makes a thread strong and useful for cheapening the material which is now so high in price. The annual value of raw cotton imports to Japan is about 100 000 000 yen with about 18 000 000 yen for ramie and 52 000 000 for wool but if the mixing of raw cotton with sea grass proves a success such large imports of raw cotton will not be necessary.

This sea grass flourishes plentifully about the shores of Japan so that there will be no difficulty in obtaining a sufficient supply if it comes into general use among spinners. The botanical name of this grass is *phyllophora sordida* or sugamo in Japanese but in the different places where it grows different names are used by the Japanese, such as umi no chikyo, umi guno and so on. The quantity available is believed to be unlimited.

(The Japan Magazine)

FOREIGN TRADE NOTES.

Raw materials for the mother of pearl industry in Italy are greatly needed, together with new machinery.

A deficit of 120,000,000 francs is reported in the accounts of the Belgian Government railways for 1919.

A law has been introduced in the Portuguese Parliament for granting financial autonomy to the Portuguese Colonies.

Between February 6 and 20 1,500 tons of Zanti currants, valued at £250,000 were shipped from Greece to the United States.

The German Potash Syndicate reports production of potash for 1919 at 946,000 short tons of which 264,000 tons were sold abroad.

A further increase, the fourth since the beginning of 1919 has taken place in the schedule of prices of potash for German home consumption.

During the last ten years according to an official report, the importation into Italy of Japanese mother of pearl buttons, has increased 100 per cent.

Plans for air traffic between Sweden and Poland are under consideration by two Swedish companies, one of which is being supported by British capital.

Imports from the United States of condensed milk, butter, cheese, sugar, and canned meats have been prohibited, until further notice, by the Italian authorities.

The shortage of sugar, butter, coffee and milk is so great in Italy that the authorities have decided to tighten food control and to return to strict rationing.

During the last financial year the expenditure of the Belgian Government amounted to 8500 000 000 francs being an increase of 1 000 000 000 francs on 1918.

The German postal authorities have decided to raise the parcel post rates by 67 per cent, and to impose a letter rate of 30 pfennigs up to 20 grams and a postcard rate of 20 pfennigs.

According to statistics recently published the gross earnings of 202 railways in the United States for 1919 increased 5.25 per cent whilst the net earnings decreased by 15.80 per cent.

About 10 000 tons of currants were available for shipment from Greek ports last month. The quotations for the fruit were 1s 3d higher than in January, but its quality was reported to be poor.

An official statement gives the projected expenditure of the Portuguese Government for 1920-21 at the sum of 234 679 251 escudos. The revenue for the same period is estimated to produce 119,615,317 escudos.

A Consular report states that the harbour works at Kobe are now nearly completed and that a depth of 36ft

has been obtained by constant dredging along the new piers. The works were started 12 years ago.

During the first eight months of 1919 vessels totalling 990 717 tons used the piers at Kobe, whilst 4,284 757 tons of shipping from foreign countries entered the harbour and discharged their cargo on lighters in mid stream.

American exports to Italy have, during the past three months, declined 20 per cent, and owing to the high exchange rates the Italian Government has laid more stringent rules to prevent the export of capital from the country.

It is reported from Tiflis that the local authorities have entered into a contract with an English company for the sale of Georgian produce and merchandise in foreign markets. The capital involved in the arrangements is stated to be £5 000 000.

British investments in the Latin Republics exceeded £1 000 000 000. There is keen competition for business and business men hold an encyclopaedia of Spanish languages in which some of the chief countries of the world are being written.

Mr Cassin Brown of the Indian Geological Survey who has been on duty for some time in India has been attached to the office of the Indian Food Commissioner in London and can bring to all sorts of food knowledge to bear in answering inquiries about Indian mineral resources.

Board of Trade Accounts. The form of the accounts of the Board of Trade is being altered. The number of headings being increased from 825 to 1000 for imports and from 606 to 1360 for exports. Additional headings are opened under 'machinery', 'chemicals', 'cotton', 'wire', 'glassware', 'abrasives', 'cutlery', 'household implements', 'instruments & vehicles'. The result of the new trade will be made both by quantity and by value.

More British Exports to America. According to the Board of Trade returns for January last there is a steady upward tendency of both imports and exports, the proportionate difference between the two being very small. They show 105 millions of exports for January 1920 as against 45 millions in January 1915 while the former are promising. In immense quantities of goods are exported to America and to countries which are in debt to Britain immense quantities are imported from countries which she is in debt to. Improvement is noticed in her exports to the U.S.A. chiefly in cotton and woollen goods and the exchanges between America and Britain cannot be

set right until the latter receives less and sends more. Moreover, Britain acts as a buying Agent for the whole of Europe. Thus she bears not only her own burden of debt but also that of Europe to America in terms of American dollars in exchange for pounds.

The isolation of Russia is said to be one of the causes of social disturbance in Europe since Russian supplies not being forthcoming the rest of Europe is forced to draw its food and raw material at exorbitant cost from America.

The Association of British Chemical Manufacturers has published a Directory of Members and a classified list of their Manufactures in seven languages.

Dutch and Scandinavian import houses in the Argentine represent important firms in Switzerland and other parts of Europe who turn on their power plants are preparing to compete with the Americans.

A great shortage of dyestuffs prevails in Hong Kong and attempts to obtain supplies from the United Kingdom have not so far been successful.

Canada is applying to France for a quantity of shoes and woollen undergarments. There is an unusual demand for these commodities in the country.

The production of cord in Canada during 1919 is estimated to be 1 500 000 hundred tons, compared with 14 987 900 tons in 1918.

The local authorities in Mauritius have caused a 10 per cent discount on the import of rum and spirits by a sudden proposal to levy a special duty of Rs. 10 per ton on all rum held in stock at that rate.

The price of rice in Mauritius—where it is the staple food of the labouring population—is considerably reduced as a result of large imports from Malacca and elsewhere which have taken place during the last four months.

Owing to the duties charged on the large imports of wines and spirits through the port of Nassau (Bahamas) from the United States the Budget deficit for the last financial year estimated at £10 805 has been turned into a surplus of £110 418.

An arrangement has been made between the Canadian National Railways and the French railway authorities for mutual exhibits of the produce and manufacture of the respective countries on special trains that will call at the chief towns of France and Canada.

Export trade of New Zealand

Exports of produce in the 10 months ended October 1919 were £46 570 000 against £44 050 000 in the corresponding period of 1918. Exports for the year ended October 1919 exceed £50 000 000.

NEWS AND NOTES.

H E Lord Willingdon performed the opening ceremony of the Madras Stock Exchange on Sep 17

The gain to the Government of India on exchange during the current year is estimated at Rs. 11,75,00,000 of which Rs. 7,25,00,000 will be credited to Railway and Rs. 4,50,00,000 will be appropriated to meet the capital loss on the sterling and gold holdings in the paper currency reserve.

The membership of the London Chamber of Commerce exceeds 9000.

According to an authoritative informant of the New York Sun the British Government has received from Germany in payment for foodstuffs and other supplies between £ 32 000 000 and £ 40 000 000 in gold. The gold does not appear in the Bank of England statement but held in London for the account of the British Government and is earmarked for shipment to New York in four instalments.

The State Department Under Secretary submitted to the Supreme Council a desire to plan for the opening of commercial relations with the Soviet Union without any recognition of the Soviet Government.

The total quantity of iron purchased in the month of January amounted to 10 million lbs. and that of other goods to 20 million lbs. as compared with 12 million and 27 million lbs. respectively in the corresponding month of the preceding year.

The following resolution of the Government of India dated 15th March is published in the *Fort St George Gazette*

No 849 F --In consequence of the acceptance of the recommendation of the Indian Exchange and Currency Committee that the exchange value of the rupee should be fixed at one tenth of the gold content of a sovereign the Government of India have with the approval of the Secretary of State for India decided that the rate of Rs. 10 to the £ shall be adopted for the conversion of all existing transactions into rupee and pice and in all Government accounts and statistics with effect from the 1st April 1920. The budget estimates for the year 1920-21 have been prepared on the basis of the 15 rupee rate but they will be recast on the new basis as soon as possible after the 1st April.

The new rate of Rs. 10 to the £ will also be applied to the expression sterling as far as practicable in all official documents and correspondence from the 1st April 1920. Gold coin and bullion, however, will continue until further orders to be valued at Rs. 15 per £ in all Government accounts and returns inclusive of the accounts of the Paper Currency and Gold Standard Offices.

Speaking at the reception of the National Indian Association in honour of his election to the Royal Society Sir Jagadish Chandra Bose emphasised that it was not by entering into controversies but by steadfast work by proving that the people of the world be incomplete without India. He stressed that Indians could raise their Country and serve the betterment of humanity.

The juice of a single palm contains 12 per cent of oil. Experiments have shown that the process of extraction can be carried on with every prospect of commercial success, the yield amounting to 4,000 lb. to the acre. In French North Africa there are about 100,000 acres covered with *Empress palm*. In Mauritania they have also obtained oil from *Opuntia*. The oil contains 20 per cent of acyl chloride and a favourable balance of the paraffins. In 1911 there were 75 distilleries in the Sudan equipped to produce 2 million gallons of oil at 25 p. cent a barrel in debitt form the rest used for burning kerosene.

Mr. P. V. Sathu, manager of a firm of Messrs. P. V. Sathu Company of Madras who proceeded to London and the United States last year returned to Madras. He went as purely a businessman and in the United States he made a protracted stay studying the latest methods of dry-bulb tuning.

A general meeting was held at the Mahajana Sabha Hall Madras to consider the question of starting an institute for warping and spinning and to encourage handloom weavers. Sri J. Subramanian of Kumbakonam was in the chair. It was resolved that a limited liability Company be formed for establishing a warp preparatory factory on the premises of the Association the share capital being the substantial share in the concern. The authorised capital was fixed at Rs. 50,000 and the issued amount at Rs. 100 each. It was further resolved that the yarn be rendered to handloom weavers by supplying ready warp duly sized with length and breadth suitable to them at a cheaper rate.

than what it now costs them to work the handloom and that the Government be requested to render departmental help with expert aid and advice and such other assistance, in the shape of money grants towards recurring expenditure besides giving the site and the buildings for establishing the institute.

Mr Chandulal M. Kothari, Honorary Secretary of the Madras Stock Exchange, spoke to the Press as follows:—

"During the last six months Bombay has promoted two limited concerns, the Malabar Rubber Company and the Malabar Forests and Rubber Company, with a capital of two crore and one crore respectively. When people in Bombay with a Board of Directors at such a great distance consider such a field in India a profitable one—and the quotation of the price of the shares of the first concern has proved that the industry must be profitable—how can it be that the Madras Presidency with all these sources at its disposal allows others to exploit and take advantage of it? It is that we on this side believe that the industry is not paying? If so, the either the people in the Madras Presidency are enlightened or better. If not, so is

it that we on this side have not sufficient technical knowledge about forestry and agriculture? To say this of a Presidency which is drawing its income and resources chiefly from agriculture and forestry amounts to a mere mockery. Hence the only conclusion that we can draw from this lithargy and ineptitude is that Madras in spite of its resources sufficient technical and business knowledge at its back is backward because of want of proper organisation and capital. Will capital in the presidency continue to remain so shy as to allow others to exploit our own resources and make huge profits? Will not such flotation outside the presidency for exploitation of our own resources be an eye opener to the investing public and business men of the Presidency?

The Panchayats. It has been notified that 157 Panchayat Courts will be established in the districts of Chingleput, Tiruchinopoly, Annamalai, Tanjore and Madurai for the settlement of such courts being 65 and 49 respectively in the Annamalai and Malabar District.

Dr. L. B. Day. The appointment of Dr. Lumin B. Day, I. L. S., as Additional Professor of Chemistry in the Government College, Madras, has been sanctioned by the Government of India.

SHORTAGE OF RICE.

In 1918-19 the all India rice under cultivation was what less than 20,000,000 acres as against 25,000,000 in the previous year. But the average yield per acre which in Burma is normally about 140 lb. fell to no less than 14 lb. with the result that the crop yielded only 2,500,000 tons as compared with 6,250,000. The difference was due to the defective monsoon of 1918. In consequence of the resulting depletion of stocks, the surplus India absorbed last year almost the whole of the Burma surplus available for shipment (taken 1,750,000 tons in nine months) while a small balance went to countries having a large emigrant Indian population. In the present year India's requirements are likely to be much smaller than after the bad monsoon of 1918. The final forecast for the entire crop makes a substantial improvement of nearly 2,000,000 tons, though this falls far short of the normal yield. If reports from India were unrestricted the demand of foreign countries would probably draw out stocks required for replenishing the reserves which are a feature of the rural economy of the country, and prices would be forced up to a level causing

hardships to the poorer classes. Hence it was decided that exports of rice from India should be limited to the surplus estimated to be available after providing for India's need.

England is to be content with little more than a quarter of the normal previous import, though it should not be forgotten that a large part of this normal shipment was re-exported. On the whole, England is said to have been remarkably well served by the maintenance of control. After meeting the estimated Indian requirement of 7,000,000 tons, there is a balance of some 5,600,000 tons of rice for other countries. It is held partly that the first claim is for India populations in British Colonies. The allotment of the surplus of the first quarter of the year in tons has been—Ceylon 90,000, Straits Settlements 60,000, Mauritius, 14,000, the United Kingdom 50,000, other countries 85,000, total 299,000. This leaves a balance of 2,81,000 to meet the requirements of India.

THE WORLD MARKET

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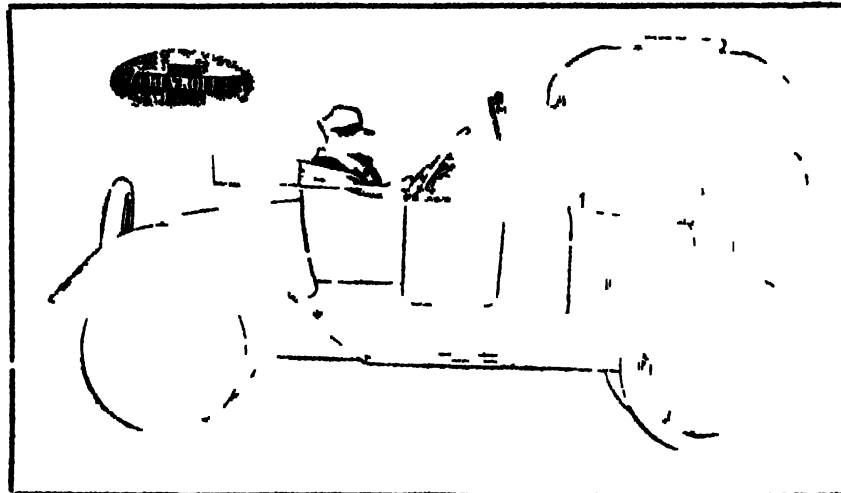
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"COMMERCE & INDUSTRIES"

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MADRAS, JUNE, 1920.

No. V

THE INDIAN CHEMICAL SERVICE.

THE report of the Chemical Services Committee 1920 has been published.

The Committee was presided over by Prof. F. Thorpe, C. B. F. D. Sc., Ph. D., F. I. C., F. R. S., Professor of Organic Chemistry in the Imperial College of Science and Technology, London, who arrived in Bombay on the 15th November 1919, toured through the Provinces, and concluded the business on the 28th February 1920. The function of the Committee is "to formulate proposals for the organisation of a Chemical Service for India, and for the location and equipment of research laboratories."

The President observes that the Chemical Industries of India can be adequately developed with the aid of an efficient Government Chemical Service and "that if the resources of the country were developed to their fullest extent India would take her place in the front rank of industrial communities." He acknowledges the "unquestionable need for technological institutes" in India. There should be Trades Schools to train foremen in the "technique of their trades." An Industrial chemist with adequate training in the methods of Research and knowledge of the principles of Engineering and Machine drawing will be in a position to master the

technical details of the chemical processes concerning the factory work. He will thus be in a position to manage and control the working of a Factory and may even take up the work of a consulting chemist. Another class of chemists will be the Professors of Chemistry in Universities who are to be researchers in chemistry and teachers with adequate training both in the Science and in Research. Just like the hospital experience necessary for a medical man or the workshop practice for an Engineer, factory experience in some chemical works is essential for a chemist. In India there are very few chemical factories where students can receive adequate training. It is proposed to impart instruction by means of large scale appliances involving the use of metal apparatus instead of the glass apparatus now being made use of. It is quite possible to erect a Laboratory on a small scale with types of "every kind of plant used in chemical manufacture." In order to afford facilities for factory training, it is proposed to erect demonstration factories. The establishment of Provincial Research Institutes in the chief industrial centres in each Province, and of a Central Research Institute under Imperial control at Dehra Dun is recommended.

One satisfactory feature of this Report is the proposal to recruit the Chemical Service mainly from Indian sources with a view to achieve success and to provide for adequate chemical training in Indian Universities. It is to be seen how far this proposal will be translated into practice. The Committee recommend the formation of the Chemical Service with the primary object of encouraging industrial research and development in view of the experience gained during the recent war that the Scientist and the Manufacturer should co-operate and work for the common cause. In England the manufacturers who are admittedly enlightened and enterprising employ their own chemists in their own research laboratories for the purpose of making useful discoveries, "the results being placed on a commercial basis and worked either by patent or in secret for the benefit of the firm concerned." This system cannot be altered and is bound to continue in the interests of the firms themselves. With a view to develop the industries of this country both for the benefit of the State and the manufacturers and in order to investigate into the problems of importance which are neglected or passed over by the firms, being less remunerative, the proposed Research Laboratories are brought into being. In England, numerous firms dealing in the same industry form themselves into Research Associations and are aided by the Department of Scientific and Industrial Research by contributions usually to the extent of £1 for every £1 subscribed by the firms forming members of the Associations. "The payment by the Department is for five years by which time the members of the Associations will have realised the value of research and the Associations become self-supporting. The conditions prevailing in England where the industries are highly developed and the technical and scientific education and training are advanced and

controlled by the people, are quite different from those prevailing in India where the material resources are undeveloped, education is controlled by Government and the people are exposed to foreign competition and are not protected by State aid, in spite of their vigorous attempts to make the country self-supporting and to make India one of the leading manufacturing and exporting nations of the world. Hence, the people are left behind and the Government Departments of Agriculture, Forest, Industries and Commerce have taken the lead in carrying out organised work in research and investigation. For instance, the Forest Department proposes to erect plant and machinery to investigate the possibilities of paper manufacture from forest grass, match making and the extraction of essential oils and tannins. These Departments, when addressed by an inquiring firm for any information relating to manufacturing industries, generally refer such firm to some manufacturing firms in India who would naturally decline to furnish such particulars in their own interests. Thus the Government Department have shown to be lukewarm in the matter of assisting Indian firms.

The terms of reference to this Committee were —

(1) To consider whether an All—India Chemical Service is the best and most suitable method of overcoming the difficulties and deficiencies pointed out by the Indian Industrial Commission (2) In the event of the Committee approving the principle of an All-India Service, to devise terms of recruitment, employment and organisation, to indicate the extent to which chemists already in Government employ, should be included in that Service, and to suggest what should be the relations of the proposed organisation with the public and with Departments of the Government of India and of Local Governments.

(3) In particular to frame proposals for the location, scope and organisation of institutions for chemical research

The Committee was constituted with seven members of whom Sir P C Ray is the only Indian member

The recommendations of the Committee are summarised as follows —

(1) That a Chemical Service called "The Indian Chemical Service" be constituted and controlled by a Director General

(2) That a Central Imperial Chemical Research Institute be erected at Dchra Dun under the Director General of the Chemical Service, as Director, assisted by a member of Deputy Directors

(3) That each Deputy Director should be in charge of a separate Department and that, in the first instance, there should be four Departments, (a) Inorganic and Physical Chemistry (b) Organic Chemistry (c) Metallurgical Chemistry (d) Analytical Chemistry

(4) That a Provincial Research Institute under the control of the Local Government should be erected in each Province near the Chief Seat of Industry in that Province and that each Provincial Research Institute should be under a Director of Research

(5) That the functions of the Central Imperial Institute should be as follows (a) To create new industries and to carry out the development of new processes up to the "semi—large" scale or further if necessary (b) to investigate those problems of a fundamental character arising from the work of the Provincial Institutes, which have been transferred to the Central Institute by the Local Director of Research in consultation with the Director General. Such problems will be those which have no apparent immediate practical importance, but which in the opinion of the Director-General and the Director of Research are likely to lead to discoveries of fundamental industrial importance affecting

the industries of the country generally, (c) to assist in the co-ordination of the work in progress in the Provinces, both by means of personal discussion between the officers of the Central and Provincial Institutes during the course of the tours made by the Director-General and the Deputy Directors, and by means of periodical Conferences of Provincial and Imperial officers, (d) to carry out such analytical work as may be required and to correlate the methods of analysis in general use throughout the country, (e) to maintain a Bureau of information and Record Office; and (f) to issue such publications as are considered necessary

(6) That the functions of the Provincial Research Institutes should be as follows (a) to maintain close touch with the works chemists and with the works generally and to work out any problems which may be submitted to them, (b) to develop and place on an industrial scale new industries which have been previously worked out on the laboratory and "semi—large" scale by the Central Imperial Institute, (c) to carry out such other work as may be necessary to establish and foster new industries peculiar to the Province, (d) to carry out such analytical work of a chemical character as may be required in the province, and (e) to erect and control substations in such parts of the Province as the development of industry may require

(7) That, under (a) above, arrangements should be made by which a firm supplying a problem should have the use of the solution for an agreed period of time prior to its publication.

(8) That members of the Service should be lent to private firms as occasion demanded and should, during the period of their service, be paid an agreed sum by the firms.

(9) That the Research Institutes should not undertake manufacture in competition with private enterprise, but that chemical industries developed in accordance with 6 (b) above

should be handed over to private firms as soon as practicable

(10) That, whenever necessary, experts should be employed to establish chemical industries based on known process

(11) That the work of the Central Imperial Institute should be controlled by a Board of which the Director-General will be Chairman and which will comprise the Deputy Directors and such other persons as the Government of India may determine

(12) That the Central Imperial Institute should have no administrative control over the Provincial Research Institute, but that no appointment as Director of Research should be made without consulting the Director General

(13) That the Director General and Deputy Directors should visit Provincial Research Institutes periodically and co-ordinate the work done in each

(14) That Chemists employed at Provincial Research Institutes should be appointed in the first instance by the local Government in consultation with the Director of research and the Director-General

(15) That Chemists so appointed should be members of the Chemical Service and should be seconded for service under the Provincial Governments and be paid by them

(16) That Agricultural Chemists should not at present be included in the service

(17) That the relations of the Chemical Service to the Forest Department, the Ordnance Department, the Chief Inspector of Explosives, Assay Masters, the Medical Stores Department, the Geological Survey and other Government Departments, employing chemists should be as stated in Chapters V and VII. of the Report

(18) That a Ministry of Science should be created as soon as practicable

(19) That recruitment to the Chemical Service should be as described in Chapter XV of the Report.

(20) That the Deputy Director in charge of Analytical Chemistry should co-ordinate the methods of analysis in use throughout India and should act in an advisory capacity to the various Provincial Government Analysts who should be attached to each Provincial Research Institute

(21) That Provincial Government Analysts should be under the control of the Directors of Research and should take over the chemical work now carried out by the Chemical Examiner and the Government Test House

(22) That the question of the connection of the Indian Institute of Science, Bangalore with the Chemical Service should await proposals from the Council of the Institute

(23) That the location and equipment of the Central Imperial Chemical Research Institute should be as described in Chapter X of the Report

(24) That the location, control and equipment of Provincial Research Institutes should be as described in Chapter XI of the Report

(25) That a Bureau of Information and Record office, a Library, and a Museum should be attached to the Central Imperial Institute and to each Provincial Research Institute

(26) That the Central Imperial Institute should issue applications as described in paragraph 71 of the Report

(27) That a chemical Survey of India should be carried out at the earliest possible moment

(28) That recruits for the Chemical Service should be trained in the manner described in Chapter VI of the Report.

(29) That members of the Service should be seconded to the Education Department and to University Institutions, if required.

(30) That the Government of India should give maintenance and equipment grants to students to enable them to undergo the training in chemical research required for recruitment.

(31) That the position, of the Director-General and of Directors of Research should be as described in Chapter XIV

(32) That the pay, pensions, leave and allowances of the Chemical Service should be as detailed in Chapter XVI

(33) That liberal grants, free from the customary accounts, restrictions, should be given for the initiation of the scheme and for the development of industries through the medium of Chemical Research

The conclusions of the Committee appear to have been based on "a large body of written evidence" placed before them. No one knows what this evidence is and who the witnesses were. At any rate, we have not been furnished with it. We have therefore to presume that such written evidence is not open to the press and the public.

Sir P. C. Ray, the only Indian Member of the Committee, has attached his able note of dissent. It is just like the masterly note of the Hon'ble Pandit Malaviya to the Report of the Indian Industrial Commission, or the note of dissent by the Hon'ble Sir Sankaran Nair in the first despatch on the Indian Constitutional Reforms, or the recent minority Report of Mr Dalal of the Exchange and Currency Committee. It is but natural to expect that the Government will view Sir P. C. Ray's note as they have done in the case of similar minority reports.

Sir P. C. Ray begins his Note by saying, "On principle I am opposed *ab initio* to the creation of an all-India Chemical Service," while the report of the Committee says "that the development of the Chemical Industries in India could only be adequately realised through the agency of an efficient

Government Chemical Service." Evidently, the Government want to take the lead in the matter of the industrial development by beginning at the top while the people of the land have been admittedly backward in point of industrial education and training with the result that the manufacturing industries are yet in the infant stage. Even in England, the opinion of the people or of the majority of the scientists and Expert Chemists does not seem to favour the creation of the Department of Industrial and Scientific Research. In India, Chemical Industries worth the name are yet to be started. Institutions like the Bengal Chemical and Pharmaceutical works which are very few in number have their own Research Laboratories and will make their own arrangements to obtain suitable experts for them.

If India is destined to take her proper place among the manufacturing nations of the world by taking advantage of the vast undeveloped natural resources, the only course that can safely and most economically be adopted is to let the people take the initiative in the matter of industrial work by introducing suitable reforms in the educational system of the country, by starting Industrial Schools, and Technological Institutions where training of the up to date standard can be efficiently imparted by the introduction of the modern methods in all the branches of Engineering and by minimising, as far as possible, the necessity to go to foreign countries for the requisite training and education. The absence of the educational facilities and opportunities for efficient training in this country is keenly felt. This point requires the adequate consideration of the Government and the people if it is the real intention to make India self-supporting and self-contained. The total absence of educational facilities by the employment of modern methods has killed all the power of initiative and originality and the capacity for

invention in the minds of the young men of this country. It will be failing in the discharge of the paternal duty of the State and the non-official leaders of the people to neglect the youth of the land by shutting out all the opportunities for the display of their latent natural powers

The Creation of the proposed Chemical Service is against the natural order of things in a backward country like India where the majority of the people are poor, dependent and helpless, there should be schools for industrial and technical training to start with so as to give impetus to the starting of the manufacturing industries. When such industries are developed, the manufacturers themselves will organise into Associations and demand the aid of the State for Research and Expert Chemists. Then, it will be open to the State either to grant contributions to aid the private Associations for research or to organise a department of Research for the benefit of the manufacturing chemical industries. Instead of helping the growing spirit of the industrial enterprise of the country, the proposed "Service" will add to the existing "Services" when the work proposed to be done by the specialised Service could conveniently be done by the existing Forest and Agricultural Departments. The Department of Industries has been in existence for several years past and the proposals to enlarge this Department in each Province are already under the consideration of the Government. The public are not aware of the real functions of the Department of Industries, what progress has been achieved so far, what particular industries have been developed consistent with the period of its existence and the expenditure incurred and how far the Bureau of information of the Department has served to become popular by supplying useful information to the public to enable them to start new industries so as to justify the increasing

expenditure of the Department. Better progress could have been achieved by granting contributions to private enterprises instead of increasing the expenditure on the Industrial Departments. It may be admitted that there is great need for research work in India. Such work can be better and more advantageously carried out by endowing the Universities with special grants to enable them to equip their laboratories to satisfy their requirements. Thus, considerable saving of public money can be effected.

One of the greatest objections to the creation of the Chemical Service is that it is uncalled for in the best interests of the people under the existing circumstances, that the organisation of the Service is infinitely costly for a poor country like India which cannot afford to spare the enormous funds for the purpose at a time when the people are not well-educated in the industrial and chemical field and the Universities ill-equipped, and that the work assigned for the Chemical Service could be done by the enterprising business firms who have often relied on the advice of technical experts imported from foreign countries. It is very likely that the experts employed in the Service after some years of experience and research work will start their own manufacturing industries instead of sticking up to the Department when there are greater chances for making their fortunes in independent firms. Even when the services of Departmental experts are lent to private manufacturing firms, it is apprehended that satisfactory results will not be achieved as such firms have no disciplinary control over the Government experts.

The proposed scheme is for the creation of a regular Department of Government with Directors and Deputy Directors, Provincial and Imperial, with the highest salaries open to them. The monthly salary of the Directors of Research is Rs 2000—2500 while the

Director-General gets a salary of Rs 3500 excluding allowances, whereas in England, the salary of the Head of the Imperial College of Science and Technology, London, draws only £ 1500 per annum or Rs. 1250 per mensem and the Head of the Government Chemical Laboratory gets £ 1200 to £ 1500 per annum. Further, the proposed scheme involves the expenditure of several lakhs of Rupees for Buildings, Equipment and Maintenance, by way of Capital and Recurring expenditure, for which no definite estimates are yet given. It may be mentioned in this connection that, according to the Indian Industrial Commission the construction of the Imperial Institute at Dehra Dun cost Rs 20,00,000 with an annual recurring expenditure of Rs 5,00,000. The Indian Institute of Science Bangalore, cost Rs 10,00,000 for buildings and laboratories &

Sir P. C Ray evidently has been pleased with "the principle that recruitment for the Indian Services must be made in India." But, it will be realised that in practice this principle will apply to the recruitment of the subordinate staff while the superior Establishment will be European as has been the case in all the Departments of Government. More will depend on the spirit in which the principle is applied in practice. When there is a crying need for technological Education and Training for which our young men are annually compelled to go to Japan, America and Europe, the organisation of the Chemical Service as recommended by the Committee will only promote the interests of foreign firms established in the land and will help them in the exploitation of the resources of the country while Indians are yet new to the field.

HOW THE WORLD MOVES.

THE SUCCESS OF THE AUTOMOBILE

THE year 1920 marks an epoch in the history of the United States Automobile industry which takes the third place on the list of American industries. Even in the rural districts, horses are being rapidly replaced by motor vehicles. In the current year, it is expected that the automobile industry will successfully beat out the manufacture of clothing and will rank next to the steel industry. In the United States where the automobile industry occupied a position of practical obscurity in 1898, there are to-day 7,600,000 motor vehicles and their number is expected to exceed 15,000,000 in the next ten years. It is no wonder to imagine that this American Industry has succeeded in capturing the markets of the world.

The motor car which was two decades ago noisy and defective has become to-day a

powerful, quiet and easy-going machine of remarkable efficiency, while attempts are still being made to build cars of the lowest cost and upkeep consistent with a maximum of life. The Motor car is regarded less as an item of luxury and extravagance and more as a business necessity and a source of economy. It has become indispensable to a professional man, like a doctor or a salesman as it affords greater possibilities of seeing more prospective customers in the course of the day. In fact, it is regarded as a gilt-edged investment. Apart from the business point of view, its utility has enhanced owing to the important part it plays in the advancement of health, pleasure, comfort and social life. The modern clubs owe their existence and increasing popularity to the conveniences afforded by the automobile. Instances are

common now-a-days where the entire families are bundled into a motor car for taking a holiday trip. In short, the automobile has contributed infinitely to the advancement of modern civilization, prosperity and comforts of the world

The first commercial vehicles were made in 1908 by a Cleveland Company in the U S A. Now, owing to the inability of the European manufacturers in producing enough cars, Europe, South America and the Orient have placed large orders with the U S A manufacturers. In the year before entering the war, America produced 1,900,000 motor vehicles, Great Britain 40,000, and France 50,000 cars. As a surprise to the whole world, America expects to produce 2,700,000 cars in 1920. New York has 600,000 cars or one car to 18 persons while Great Britain has one car to 80 inhabitants. Such being the success of the motor vehicle throughout the world the Youth of India has been kept back in the field of mechanical science and rendered blind for generations to come.

INDUSTRIAL PROSPERITY

It has been reported that, owing to a strike of the steam service men of Sheffield 30,000 steel workers were kept idle and the steel industry lost £ 500,000 for the first ten days of June 1920. At the close of this month the employees of the "Times of India" Bombay struck work. What does all this mean? Large quantities of food and raw material are constantly exported from India to Europe and other countries as the deficiencies in the foreign markets caused by the war are being filled up while the Indian market has become dependent on the supply of foreign manufactured goods. Owing to the severe neglect in the past on the part of the people and the State in the matter of industrial development, India offers to the foreign nations greater opportunities than ever before and their industrial prosperity is assured for

many decades to come. Their industrial predominance has enabled them to capture the foreign markets and to quote prices in advance with a view to secure forward contracts. In view of the Labour demands, the manufacturers abroad and the local retailers in their turn are quoting higher prices which are affecting Indian consumers adversely. Thus, there is an immediate danger ahead of the people. If this danger is to be averted, Indians as a community must realise the economic necessity of each man and woman contributing his or her share to the industrial progress of the country by manufacturing the necessaries of the country and helping the export of raw material in a finished form.

BANKING IN INDIA

Our esteemed contemporary, the Daily Telegraph, London, writes thus — The inadequacy of banking facilities in India provides the theme for an article in "Commerce and Industries," a monthly journal published in Madras. It is pointed out that while the United States, with a population of ninety millions, has over 28,000 banking offices, and the United Kingdom, with a population of forty-six millions, has 9,300, India, with a population of 315 millions, has but 359 banking offices. Moreover, Canada, with not a quarter of the population of India, has ten times the number of banking offices. One natural result of this inadequacy of banking facilities is that a great deal of capital is hoarded. For the great majority of agriculturists in particular banking facilities practically do not exist. Their savings are kept in the form of gold or silver sovereigns. The co-operative credit movement in India is still in its infancy, but it is gradually preparing the ground for the extension of banking in rural areas. For industrial development banks of a special character, which can give long-period loans, are needed. The Tata Industrial

Bank, which was established recently, supplied a long-felt want, but there is room for a large number of banks of a similar character. The Indian Industrial Commission recommended that an expert committee should be appointed to formulate a scheme for financing industrial concerns and to decide the responsibility of the State in the matter. The failures of the small Swadeshi banks in 1913-14 were in most cases due to inexperience and lack of a trained staff. The Industrial Commission's Report points out that "there is in India at present a lack of trained employees, owing to the absence in the past of facilities for commercial education and of a regular system of training Indians in banking work."

POVERTY IN INDIA AND THE MASSES

Before the war there was considerable talk about the poverty of the people in India and there was almost invariably a reference to it made by almost every speaker on the platform and in the Legislative Councils in India. In short almost every budget speech contained a reference to the conditions of poverty in the country. The situation during and after the war was not improved but has become more and more acute. It could not possibly receive the adequate consideration of the leading Indian public thinkers and workers whose attention has been detracted by the political agitation for the Reforms to obtain democratic control over the administration of the country. Such a control, if really and wisely exercised, will go a great way towards mitigating the growing poverty of the land. In order to achieve successful results for the progress of the country, there is yet considerable need for systematic and organised work among the public workers in India who should work with a genuine motive to serve the true interests of the people with less of personal ambition and more with a sense of real duty to the country. The time has come when they are pledged

They have yet to concentrate their active attention more wisely on questions of broad principle with an unbiassed mind and treat public affairs as distinct from personal or private matters. The Reform Act has enlarged the electorates and the Legislative Councils. The prosperity or the suffering of the people will depend on whether they exercise their right wisely to return competent men to the Council or blindly vote for any ignorant and incompetent person who will succeed in influencing them. Time has come when the best and ablest men with unselfish and impartial views are required in the Councils who can raise the economic condition of the country and bring credit to the nation by mitigating poverty. It must at the same time be recognised that there is a greater need than ever before for institutions and opportunities for imparting that education and training which are so essential for the people and their leaders alike to achieve real success in the fields in which they are working.

When India is getting poorer and poorer day by day, when prices are rising with lightning speed without corresponding increase in the earning power of the people, when the majority of the people are ignorant, and uneducated, groaning under poverty and distress of some kind or other without external help, when the war has made a handful of men abnormally rich and the rest poorer than before, and when India is not able to produce enough to meet the requirements of the people even if the exports are restricted while the manufacturing industries have just begun to start, no amount of inflated rupees, notes and gold Sovereigns will help the people. We are told that "our rupees will not buy even half as much food or cloth as they bought before the war." There is but one remedy. It is nothing but self-help. People must cultivate more food grains and manufacture more things for their

necessaries. In short, they must combine and organise to double and triple the production.

NEW FIELDS FOR BUSINESSMEN

It is stated that a party of 20 manufacturers and businessmen will leave England on July 7th on a tour in Western Canada with the object of investigating the best methods of extending trade between Great Britain and the Dominions. The Dominions possess tremendous undeveloped resources while the people of the land are not educated with the result that American investors are attracted towards them. As for Canada, there are very good openings for woollen factories. The increasing congestion of the Railways which has become chronic has the effect of stimulating the private enterprise to revolutionise the inland transport on an economic basis. Motor transport schemes promoted by business men and working on a co-operative basis by which the lorries will have full loads both "out and home" again are becoming more and more successful. Australia, China, India and other countries are importing American Motor cars and to keep up this business American firms are establishing depots for the supply of spare parts and accessories in India, it is said that there is a considerable demand for cement owing to the great number of irrigation and harbour construction and building schemes projected here. And, there is great demand for wire rope in South Africa.

CHANGING INDIA

The tremendous changes that are taking place abroad all over the world have reacted on the political, social and economic life of India. The machine-made goods produced on a wonderful scale with the aid of the modern mechanical appliances have successfully killed the cottage industries, the hand woven cloth, and the thousand and one handicrafts for which the

country became so famous beyond the seas for years in the past. Owing to the arrival of the Motor-cars and motor-lorries not in hundreds but in thousands, chiefly from America, which have captured the rich market of India, the bullock carts which have been in use for centuries have disappeared. Goods and luggage hitherto carried on the heads of sweating coolies are transported by means of motor-lorry which has become the most efficient means of transport of the world in modern times. When in 1909 John Morley openly expressed that the introduction of Parliamentary Institutions into India was not contemplated, the year 1919 has witnessed the Reform Act granting responsible government to India whereby Ministers are to be chosen from the representative assemblies and the will of the Legislative Assemblies is to be mandatory, subject to the veto of the Governor. The Municipal Councils and District Boards are enlarged and controlled by the people without official control as before. The electoral rolls, formerly containing a few hundred voters, are expanded by running into millions. Old houses and buildings are being demolished, new ones being constructed on modern lines based on up-to-date sanitary principles. Fabulous prices are being paid for lands which were formerly lying waste, and every inch of which is valued in gold. Towns and cities are being overcrowded owing to the in-rush of population from the distant villages which have lost all their attraction as the people, deprived of their self-supporting cottage industries, are unable to make both ends meet under the changed economic conditions and high prices. City extension and town-planning schemes are engaging the attention of the Government. The housing problem with the rapid increase in rents has been getting more acute. Calcutta and Bombay which are as noisy and crowded as London have become infinitely more expensive. Life in India as a whole is vastly changed. In spite of the world unrest, the market is controlled by foreign goods. The people having realised their position, are making voyages to foreign lands to study the world conditions and to face boldly the competition in the world-trade and industry.

REVIEWS.

THE INDORE STATE

THE Report of the Commerce & Industry Department of the Holkar State for the three years ending September 1919 has been issued by the Minister, Rao Bahadur Sardar M V Kibe, Esquire, M A M R A S. He assumed charge of the Department in September 1916. Till then, no progress worth the name was done and the Department existed only in name. He began the work in right earnest and prepared and published a munro on the aims and objects of the Industries Department together with several suggestions for the development of industries.

Prior to 1916, several investigations on the industrial possibilities of the State were made in Lac, pencil, cement, Iron, paper and chemical industries but no practical results have been achieved. During the period under review, considerable progress has been made in making enquiries and carrying out experiments and investigations in the development of Oil and Soap industries, Glass making, Blanket weaving, Paper Mill, Pottery and Leather industries, the starting of a State Bank, Railway projects and Hydro-Electric schemes. Active efforts are being made for the starting of Swadeshi Stores, and the abolition of Customs duties levied by the Government of India on the goods imported from foreign countries into Indore State. In the work of organising the paper industry, good progress has been made. A sum of Rs 90,000 was placed at the disposal of the Department for machinery and buildings which are ready for working.

There are 4 cotton spinning and weaving Mills in the Indore City and they are working satisfactorily. There is a Model Brush factory working with a capital of Rs 1,25,000. It contains the latest automatic machinery driven by electricity. There are the Tiles factory making high class bricks and Tiles, the Button Factory, which is a successful enterprise, the Thymol Factory, Iron and brass foundry, Hosiery factory, Ginning factories and numerous other industries. Proposals are made to start a Starch Manufacturing Factory at Bhopal with a capital of 15 lakhs, a Glass Factory, Tannery and other industries. Loans are granted by the State to several industrial

concerns repayable after a certain period. Prof Stanley Jevons and Mr Gibbs were engaged to give expert advice on certain matters. The information collected by the Department has been published in the form of bulletins. The Indore State Railways, the cottage industries, Industrial Schools, Electro-Hydraulic schemes and other projects are engaging the attention of the Department. We heartily congratulate the Government of His Highness the Maharajah Holkar for the magnanimous spirit with which the industries are developed with a view to promote the real prosperity of the people and the State. The Minister in-charge of the Department has shown substantial progress by laying the foundations of the industrial development on a firm basis. He has worked out several new schemes which are the sources of new income to the State. The people of the State owe a debt of gratitude to the Minister for the excellent progress he has made and to His Highness for the very forward policy and the gracious support in sanctioning the schemes and the proposals of the Department.

Ourselves

"Messrs Narasimham & Co, Limited, has been registered with a capital of Rs 1,00,000 divided into 1,000 shares of Rs 100 each. The registered office is at No 5 Mount Road, Madras. This Company having already commenced its business, will take over the business of "Commerce and Industries" as a going concern from the next issue. The one object of the Company among others, is printing and publishing. The shareholders are among the Subscribers who are our friends and well-wishers of the country. As soon as practicable, the business of printing will be undertaken. As the year closes with this number and the Directors of the new Company will take over the management, we feel it a pleasant duty to offer our grateful thanks to our numerous friends, Subscribers, Advertisers and Contributors for the kind encouragement shown us in spite of the short-comings, and for the numberless letters of appreciation from gentlemen like Sir M. Viswaswarayya and Mr. Findlay Shirras. In spite of our best attempts, the appearance of this issue has been

delayed for which we regret. Our readers are aware of the difficulties with which the Publishers are confronted, especially when they are dependant on others for printing. Our thanks are due to our printers, the Commercial Press, Triplicane, for the attention they have bestowed in spite of the enormous pressure of work. In conclusion, we thank most cordially our constituents once again for their kindly co-operation and trust that they will do all they can to enable us to successfully carry on our sacred mission to our mother land.

The Sydenham College Graduates' Association, Bombay

We have before us the first Annual Report of this Association for the year 1918-19. The Hon. Sir Ibrahim Rahimtoola Kt. C. I. E., is the President, and Principal, Percy Anstey, B. Sc., is its Vice President. Mr. G. K. Chitale, B. Com., who was one of the active founders of the Association in 1917 is the Hon. Secretary. The Association whose motto is "United we stand" aims at the promotion of social intercourse and mutual co-operation and safe-guarding the interests of the members by holding lectures and debates and organising the Employment Bureau. The Report presents a very interesting record of the activities of the Association. Mr. M. Subedar delivered the opening lecture on the "Economic Fallacies". The second lecture was delivered by Prof. V. G. Kale of the Ferguson College on the "Financial Aspects of the Montford Reforms". A paper on the "Bombay Textile Industry" was read by Mr. Deshapande. A very interesting and suggestive lecture on the "Indian Labour Problems" was delivered by Mr. G. K. Deodhar of the "Servants of India Society" who had first hand opportunity of studying the social conditions and labour problems in England.

The Employment Bureau has done satisfactory work by securing to the members good prospects and remunerative employments in some of the big concerns throughout India.

The progress of the Association achieved in the first year of its existence may be said to be very satisfactory. Prof. Anstey is very well-known, both in the students world and outside, as a sympathetic and popular Principal. The members owe him a deep debt of gratitude for all that he has done to promote

their interests and well-being. The fact that the Bachelors of Commerce are not allowed to go in for the degree in Law of the Bombay University cannot be treated as a real grievance. It might be that some of the Graduates in Commerce have failed to get suitable jobs. It is wrong in principle to allow a B. Com. to qualify himself as a Lawyer by appearing for the LL. B. Examination. It is an admitted fact that the legal profession is overcrowded while the openings in the commercial line are daily on the increase. The fact that a B. Com. could not get a suitable job is a proof positive that he did not exert his best to obtain one for himself. There is a crying need for more Colleges of Commerce throughout India to promote the economic progress of the country. Every Indian who realises his duty to his country and to his conscience should give up law in preference to a commercial career. Those who have obtained Degrees in Commerce make a mistake in thinking that they have learnt everything. They have studied the mere rudiments of the subject for the purpose of passing the examination and have everything to learn in the School of practical experience by starting their careers in Commercial concerns. The promotion of the material and economic well-being of their own country should be their ideal. We draw their attention to the words of their learned President, the Hon'ble Sir Ibrahim Rahimtoola. "What they wanted in India was that they should depend on their own soil for their requirements both as regarded their food-stuffs and their manufactured articles. They knew that India is very backward in its manufactures. While it exported a huge quantity of new materials, it imported an overwhelmingly large quantity of manufactured articles." If the education and training imparted in the College did not enable them to work successfully in the field of Commerce and Industry, the fault is not theirs. It shows that the College has not yet reached the highest level of efficiency and the sooner the defects are remedied the better. While Europeans and Indians are promoting new Industries, it is the duty of our young men to gird up their loins and put forth their best efforts for the economic development of their mother country. In short we wish success to the Association.

MILL-GEARING WORKS, LIMITED, CALCUTTA

This Company, whose prospectus appears elsewhere, has been registered with a capital of Rs 2,50,000 divided into 20,000 ordinary shares of Rs. 10 each payable Rs 5 on application and the balance on allotment, and 500 7½ per cent preference shares of Rs 100 each. Of these, only 4,955 Ordinary shares are issued to the public for subscription at par. The Managing Agents are Messrs N K Sarkar Engineers, 10 Strand Road, Calcutta. They have secured the services of Mr J Mc Donald, a practical moulder and pattern-maker of special experience in the United Kingdom. The firm manufactures lathes, shaftings and other mill requirements and rainwater pipes of high quality by taking over as a going concern the existing business of Millgearing Works at Howrah which has supplied lathes to Government and Messrs Martin and Co Stuart and Co, and Alf Herbert Ltd India requires the development of her manufacturing industries like the one taken up by this firm for which there is a great demand and it is hoped that this firm will have a bright and

successful career. Prospectus and application forms can be had of the Managing Agents.

The Technical Review

This is a Review and Digest of the Technical Press of all the countries and a survey of the Engineering Industry throughout the world. It is published at No 2, Central Buildings, Westminster, London, S W and the number before us contains important notes on Engineering construction, Factory construction and lay out, Municipal Engineering, Transportation, Military Engineering, Mechanical Engineering, Machines, Tools and Workshop processes, ship-building and Marine Engineering and other branches connected with Chemistry, Electricity, Mining and Metals, Aeronautics, and Automobiles. It supplies useful information to technical men in all branches of Engineering.

The Star Trading Association Bangalore, City

This firm has sent us a copy of their perpetual wall Calendar which has been very attractively printed with bold letters and serves a very useful purpose in every Office.

THE WORLD MARKET.

Industrial Machinery A firm in Madras is desirous of entering into communication with and receiving catalogues and advertisements from manufacturers of machinery required for the following industries —

Card-board	Soap
Paper	Pottery
Wool pulping	Sugar
Furniture and woodwork	Dyeing
Buttons	Oil extraction
Matches	

Please correspond with Box No 1 care of "Commerce and Industries," Post Box 353 Mount Road, Madras, S C

Paper, writing and printing A firm in Madras would like to receive samples and quotations for importing writing and printing paper of sorts. Please correspond with Box No 2 care of "Commerce and Industries," Post Box 353, Mount Road, Madras S C

Representatives Wanted A firm in Madras is desirous of entering into communication with the object of establishing agencies in all the principal trade centres of India and foreign countries. The business is likely to prove very lucrative. Please address Box No 3 care of "Commerce and Industries," Post Box 353, Mount Road, Madras, S C.

Agencies wanted A firm of Publishers in Madras wants Agents in the important towns and cities in India to work as representatives on very good terms. For particulars please write to Box No 3, care of "Commerce and Industries," Post Box 353 Mount Road Madras, S C

German Dye Stuffs A firm of ink manufacturers wants to receive samples and quotations of Dye Stuffs. Please Address, Box No 4, care of "Commerce and Industries," Post Box 353, Mount Road, Madras, S C

Stationery and Allied Lines A firm of Merchants in Madras desires to get into touch with United Kingdom Manufacturers and suppliers of Stationery and allied lines with a view to undertake their representation. Please correspond with Box No 5, care of "Commerce and Industries," Post Box 353, Madras, S C.

Agents for Tea Wanted A firm of Tea dealers wants agents in all important trade centres to push on the sales. Address Box No 6 care of "Commerce and Industries," Post Box No 353, Madras, S C

Spinning Machines Owing to the great demand for spinning and weaving machines for cotton, flax, hemp &c, to work by means of hand-power in cottage industries, firms of manufacturers are requested to send their specifications and price lists and to kindly correspond with Box No 7, care of "Commerce and Industries," Post Box No 353, Madras, S C

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SHORTER HOURS OF WORK

By Mr K S Abhyankar, B A

The Attitude of Government

AS an original member of the League of Nations, India was invited to send delegates to the International Labour Conference at Washington. The conference discussed, among others, the question relating to the maximum hours of work in industrial concerns. A draft convention drawn up at the Peace conference, based chiefly on the recommendations of Lord Simon and His Highness the Maharajah of Bikaner, specifically recognised that the conditions of labour in India were different from those prevailing in most of the Western countries. The Washington Conference, the delegates, while recommending generally an eight hours' day or a forty-eight hours' week for the Western countries, recommended a ten hours' day or a sixty hours' week for countries such as India. The Government of India, while apprehensive that any attempt to bring Indian labour conditions into line with those of Western countries by violent legislative changes would be disastrous to employer and employed alike, authorised their delegates at the conference to consent to the principle of a sixty hours' week for factories and mines, subject to certain exceptions. Mr N M Joshi, who was nominated by the Indian government to represent Indian labour at the conference, while personally favouring an eight hours day, did not press for it, as he saw no chance of its being acceptable, either to the Indian Government or to the Indian capitalists or even to the Indian public in general, who are jealous of the competition of foreign countries. The Government of India have now addressed a communication to the local Governments calling for their opinions on this and on cognate questions discussed at the Washington Conference, before the end of July next. It is more than a year, however, since the

Government of India first referred this question to the Provincial Governments, as arising out of the recommendations of the Indian Industrial Commission. Though all these local governments have not yet sent their replies, the majority of those who have done so favour a sixty hours week and we may expect that the Indian Factories Act will be soon amended, so as to establish a maximum of ten hours work per day.

Attitude of Indian Labour and Capital

There was a time when labourers in Bombay factories had to toil for fourteen hours a day and for all days of the month. Through the efforts of the late Mr F of Lande, they got four holiday in a month and later on the late Dr Naresh decided on giving them a twelve hours day. When the Bombay Mill Owners Association were requested by the Government to give their opinion on the question of the hours of work arising out of the recommendations of the Industrial Commission they admitted that twelve hours of work were 'too long for sufficiently close application' and a shorter working day will have a good effect on the moral health of the workmen and to a certain extent be likely to improve their output. They, however, expressed the apprehension of European competition. This was before the meeting of the Washington Conference. Last February, as a result of the strike of the mill hands, a ten hours day was forced upon them. The Bombay Mill Owners' Association have now approached Government with a request to amend the Factory Act so as to make a maximum ten hours day for textile factories for the whole country. The last Conference of the Bombay mill hands which met in December 1919, had, however, asked for a nine hours day, apparently as a compromise.

The Loitering Tendency of the Indian Workman

Some employers are afraid that the proposed reduction of the hours of work will mean a reduction in output. They complain of the loitering tendency of the Indian workman. Mr. D. M. Wadia, for example, says "It is not too much to say that a man supposed to work 12 hours in a factory is not actually employed for more than half that time. Dawdling is ingrained in the habits of the people, and a good part of the day the factory hand lounges about the compound, chatting and smoking bidis." The Committee of the Bengal Chamber of Commerce in deprecating any tinkering with the hours of work in Indian industries, urged that the Indian labourer prefers a leisurely manner of doing his day's toil to a more exacting if shorter day. His Excellency the Viceroy complained of the inability of Indian labour to concentrate effort over a shorter working period. Witnesses before the Industrial Commission made the same complaint. One or two prominent factory owners stated that the operatives did not actually work for more than 8 hours out of the 12 at present permitted by the factory law, and some witnesses said that even if the hours of work were reduced workmen would still waste so much time as seriously to reduce the present rate of production. The Commission, therefore, did not make any definite recommendation as regards the hours of employment but left the question open for further examination.

The Cause and the Cure.

As acknowledged by the Bombay Mill Owners' Association, this loitering tendency is due partly to excessive hours of work, and the remedy lies in reducing the hours and giving the workman more time for rest, repose and recreation. The housing conditions in industrial cities, the want of any inclination

for healthy recreation as a result of fagging brought on by overwork, the insanitary conditions of work in factories, the drinking habit which is also a result of fagging, and the low standard of life, all these are responsible for the lack of energy of the workman. To make him more efficient, his conditions of work must be improved. These wretched conditions are also to a great extent responsible for the migratory habits of the Indian workman. "Good housing and shorter hours" said Mr. N. N. Wadia at the Bombay Mill Owners' Association "will enable us to build up a permanent class of labour in Bombay and throughout India from which our operatives can be locally recruited." In other countries, as the Industrial Commission point out, shorter factory hours have exercised an important effect in the direction of improving the standard of living of factory hands, why should not the same effect follow from the same cause in this country? Another advantage of shorter hours pointed out by the Commission is that they help in diminishing the congestion of labourers' dwellings, by giving time for employees to come in from areas situated at a little distance from their work. The *Statesman* once raised the question whether the workman's lack of energy might not be due to the insidious hookworm disease. The paper apparently has the Bengalee workman in mind. Its surmise may not be true to the extent it supposes, but what is to be noted is that the paper looks for the cause to the physical surroundings of the workman and not to any incurable stupid dawdling tendency on his part. The Burmese Oil Company tried the experiment of reducing the hours of work, and it proved successful. Last year they reduced the working hours at the Syrium refineries from eleven and a half (including the hour and a half allowed for meals) to ten hours (inclu-

ding two hours for meals) It is reported that this has resulted in a decided improvement in the quality of the work and in a greater contentment among the workers.

The Wear-and-Tear of the Workman

The proper reduction of working hours does not in the long run mean a reduction of output. The General Federation of Labour, has summarized the demands of the working people in the formula, "Maximum production in minimum time for maximum wages." It thus recognizes the truth that shorter hours must not be accompanied by a reduction in output. The formula of the Federation means nothing but maximum *efficiency* but in appraising efficiency we must take into consideration not only what Marshall calls the earnings of a human being counted *gross* but must make special reckoning for his wear and tear. Thus even if a temporary material loss takes place, an increase in efficiency will follow as soon as the standard of life of the workman is raised, and since material wealth exists for the sake of man and not man for the sake of material wealth, the replacement of inefficient and stunted human lives by more efficient and fuller lives would be a gain of a higher order than any temporary material loss that might have been occasioned on the way. (Marshall) Lord Leverhulme of Lever Brothers, Port Sunlight, advocates a six-hours day, for, says he under the present arrangements the cumulative evil effect of fatigue lowers efficiency owing to ill health and lassitude and lack of willing efforts, it is also cruel to expect a tired man to attend a night school to receive general and technical education, whereas Lord Leverhulme expects and has experienced that with a six hours day, the health and cheerfulness of the workmen react favourably on the out-turn per head, the workmen have more leisure for general and technical education and this in turn tells favourably on the

quality of the work done. We in India must note, that this assumes that there are adequate facilities for employing the leisure hours advantageously. The employers and social service workers in this country must provide more such facilities now, when we have shorter hours in factories. The Industrial Commission also point out that until the workmen have learned how to use a longer period of leisure more advantageously, shorter hours may not be an unmixed benefit.

The Shift-system

One advantage of shorter hours is that they allow machinery to be worked for a longer time with a double shift for the workmen. In these days when machinery gets out of date in a few years, it is not economy to keep it idle during, say, twelve hours every day. With an eight hours day and with a double shift it can be worked for sixteen hours. Moreover, machinery that cannot be profitably introduced for a ten or a twelve hours day can at times be introduced for a sixteen hours day. In limiting the hours of work, the Government of India, do not propose to limit the time during which plant and machinery may be kept going. The Shift System can, however, be introduced only gradually, because in the first place, an adequate supply of trained labourers for the second shift would not be forthcoming, and even if it were forthcoming there is no housing accommodation for it in cities like Bombay. In the Tata Iron and Steel Works at Jamshedpur, for example, the plant and machinery is kept going on for twenty four hours with three shifts of eight hours each. It is, however, reported that owing probably to lack of an adequate supply of trained labourers, the workmen there have many times to work for sixteen hours and occasionally even for twenty-four hours at a stretch, in the absence of any of their number owing to illness or some other cause.

Political Importance of Labour Reform

In the pages of the *Commonweal* a protest was made against the discrimination made at the International Labour Conference. Facts, however, cannot be altered, however much we may wish them to be otherwise. The change in the working hours must be made by steps. If we take into consideration, the present habits of the workman as a result of the wretched conditions of his life in industrial cities, the absence of adequate facilities for healthy recreation and general and technical education for the workman, is also the competition of foreign countries, most thinking people in the country will accept a ten hours day as a *transitional measure*. We agree with the *Commonweal*, however, when it says that the conditions of Indian labour must be brought into line with those which are about to prevail in other parts of the world if only for one reason pointed out by His Excellency the Viceroy when he said, 'there

is a quickening consciousness throughout the country generally that the existing state of affairs is unsatisfactory and *unworthy of India's political aspirations*." His Excellency added "We believe that there is now a prospect of progress more rapid, more radical and more substantial than could have been imagined some few years ago." An instance of how industrial backwardness is incompatible with political aspirations, was given the other day by Mr. N. M. Joshi. In the committee of the International Conference, the delegates from South Africa, while accepting a general eight hours-day, asked for a ten hours day in the case of Indian workmen in their country, as India 'itself' was to have a ten hours day. Though the motion was not brought in the conference itself is Mr. Joshi opposed in the committee on the principle of racial discrimination he had to admit that the demand cannot be characterized as wholly unjust.

SUN DRIED VEGETABLES

By Rao Sahab G. N. Sahasrabudhe

SUN dried vegetables—which are prepared at the Fruit Experiment Station, Quetta, is a new discovery and they are now offered for sale to the public. This product has been prepared by Mrs. Howard at Quetta for use in localities where fresh vegetables cannot be obtained.

But it seems that the invention was the result of war necessities in America.

The Scientific American says —

Fostered by large Government contracts there is developing in this country a new industry that will be of material benefit to our economic life. This industry is called "Dehydration" or "drying of vegetables." By subjecting fresh vegetables to the action of circulating currents of warmth—the dry air—the moisture contained is exhausted

with the result the weight and bulk of the product is greatly reduced and the vegetable is made non-perishable and can be kept indefinitely. The cell structure and flavour is not injured by the drying process, soaked in water for a few hours dehydrated product is restored to its original colour, bulk and food qualities and when cooked it has the flavour and appearance of the fresh article.

At the entrance of the country into the war and when our soldiers began going abroad in large numbers, the War Department was confronted with the task of supplying enormous quantities of food to maintain the United States Army in France, at a time when the demands upon the World-Shipping were the most pressing in the history of the world. To

solve the food problems the various departments of the Government co-operated, and exhaustive tests were made of the different kinds of food available for export. The advisability of using dried-vegetables was suggested and a hearing on the subject was had in a sub Committee appointed for the purpose. Representatives of Commercial Companies engaged in dehydrating vegetables were also heard. Samples of dried vegetables were exhibited and distributed throughout Washington, to be tested for flavour and food values. The Restaurants in the Capital and Railway Trains served various dehydrated stocks supplied from the Californian plants, and the people were astonished at the similarity to the fresh. As a result Millions of pounds of dried potatoes, carrots, turnips and other varieties have already been supplied to our armies abroad and a steady stream of new form of food, speeds across the country and the Atlantic to satisfy the appetites of our boys and armies over there.

The expansion of this industry offers tremendous opportunities to this Country and even to India. With a large Commercial plant or Community plant in each

locality, a new market will be offered to vegetable growers. Thousands of acres of waste lands in the outskirts of cities, towns and villages can be utilised for the growing of vegetables and the spaces between fruit trees in orchards can be used for the same purpose. Surplus market stocks can be taken to a new by drying plant and saved as is done in England. Germany had enormous organisation for the purpose. Here dehydrated vegetables have doubtless been one of the reasons why she has been able to withstand the food blockade of the Allies. England, Italy and France are also large users of dried-vegetables.

The possibility of the new industry has been fully demonstrated and there is a wide field for Industrialists in India to utilise the waste lands and surplus products of vegetables.

The following kinds of vegetables are available for sale at the firm of Messrs Milne and Co, Bruce Road, Quetta or at the Army and Navy Co-operative Society Ltd, Calcutta.

Potatoes, Carrots, Turnips, Onions, Tomatoes, Shunchoi Cabbage and Brinjals.

Samples are shown in the Exhibition Hall.

THE FUTURE OF CHEMICAL AND ALLIED INDUSTRIES IN INDIA

By Mr L. A. Adwani

THERE is a wide field for development in this line, and the future industrial activities of the country, will greatly depend upon the establishment of a chemical industry, which is necessary for the supply of materials, that form the basis of other industries, amongst the most important of which may be mentioned textile industries, the manufacture of artificial fertilizers, etc., etc.

Under the heading of "Chemical and Allied Industries" may be included, the manufacture of Aluminium, Cement, Glass, and Soap besides the chemical industries proper, the latter are chiefly connected with the manufacture of Alkalies, Acids and various other organic substances, such as coal-tar dyes etc.

The following statistics show the importance and urgent necessity of establishing chemical industries

Imports of Chemical and Allied Products

Name	Year	Value	Tonnage
Nitric Acid	1912-13	1,06,250	256
Sulphuric Acid	1911-12	5,49,000	3,295
Other sorts of Acids	1911-12	40,740	41
Aluminous Sulphate (including Alum)	1912-13	4,67,100	1,04
Ammonium Salts	1912-13	5,51,445	80
Bleaching Materials	1913-14	4,55,000	2,740
Carbonic Carbide	1913-14	2,11,110	1,111
Copperas (iron sulphate)	1912-13	5,17,300	1,103
Cyanide of Potash	1912-13	1,15,000	243
Bicarbonate of Soda	1915-16	6,58,170	6,014
Sodium Soda	1915-16	1,72,600	4,100
Soda Ash	1915-16	2,55,700	2,609
Sulphur	1915-16	84,610	8,400
Other Sorts	1915-16	41,14,200	
Aluminium Metal	1912-13	2,11,555	1,191
Soap	1914-15	5,10,000	20,340
Cement	1912-13	6,12,010	1,60,114
Coal tar Dyes	1912-13	1,14,100	
Glass	1913-14	1,12,000	
Total Rs. 6,96,16,427			

The Alkali and Sulphuric Acid Industry

Generally together with alkalis are produced large quantities of important acids, which are essential for the preparation of coal tinctures and form the basis of many important industries.

At present every ounce of alkali used in India is imported. It is therefore almost impossible to start an indigenous industry for the manufacture of goods, in whose composition alkalis enter, or in whose manufacture alkalis and acids are largely employed. How can any articles manufactured under the above circumstances be honestly expected to compete with the imported goods. In the manufacture of glass, soap, dyes and many other important industries of similar nature we must suffer from the same disadvantage.

The *Lablane* process, for the manufacture of alkalis, is the most suited to Indian conditions, but for the process either sulphur or iron pyrites must be had in large quantities. Unfortunately, India does not possess extensive deposits of either of these minerals and where they do occur it is in such small

quantity as to be totally unsuited for this purpose.

One of these materials is also necessary for the manufacture of Sulphuric Acid, without which no chemical industry can be put on a firm footing.

At present some four thousand tons of sulphuric acid are being manufactured annually from imported sulphur. This saves to a great extent, the difficulty of transporting large quantities of such dangerous material as the acid happens to be. The price is still nevertheless very high and cannot at the best of times, be less than Rs. 150 per ton for ordinary chamber acid, which in England was sold before the war, for about thirty shillings a ton.

All the other raw materials required in the manufacture of alkalis can be had in India in abundance, and it costs that compares very favourably with that of European countries.

Although no deposits of pyrites or sulphur exist, there is an unlimited supply of Gypsum, a mineral hydrated sulphate of lime, containing about 18% of sulphur. It may be possible to recover this sulphur for use in the manufacture of alkalis and sulphuric acid. This gypsum can be had in some parts of India for Rs. 8 per ton and should it be possible to recover its sulphur contents then the problem of establishing a profitable chemical industry to deal with all the requirements of the country will be solved.

Potash Salts

Potash salts are now extensively used in Europe and America as fertilizers and might be employed with advantage in some cases in India.

A small occurrence of potash salts has been recorded at the Mayo mines, in the Salt Range of Punjab, but these do not seem, of any extent or of any commercial importance.

During the war many experiments were made in America and England on the extraction of Potash from Potash Feldspars. These are found in many parts of India in very large quantities and may possibly serve as a valuable source both of Potash and Alumina.

Dyes

The manufacture of coal-tar dyes, is a highly specialised and very complicated industry. It is very doubtful whether it would be successful at present even if the necessary funds and supply of all dyes, were available at a reasonable rate. The coal tar which is the principal raw material and forms the basis of the whole industry, is not available in India in the large quantities required. In order to obtain the necessary quantity of tar very extensive by-product coke ovens would have to be installed in the colliery districts of Bengal, which could only be done at considerable length of time and great expense. Taking all these into consideration the prospect of the establishment of a coal-tar dye industry in India does not seem at all hopeful.

Glass

Several glass factories have been started in India of late years, the most important of which are those at Jhalgaon, Naini, Jubbulpore and Umbala.

In the manufacture of glass a very large quantity of soda and potash salts and other chemicals, are required and which at present as already stated are all imported, costing the

glass works much more than for what they may be obtained in Europe.

None of the glass works seem to have obtained the results which were anticipated and this must be due to a great extent to the high cost of alkalis. If alkalis could be obtained in the country at the same rate at which they can be had in Europe there seems no reason why glass works in India should not be successful and paying propositions.

Soap

India grows enormous quantities of various oil seed such as cotton seed, linseed and etc.

It has been estimated that some 5 to 7 million pounds sterling worth of oil seed is annually wasted owing to want of proper means of treatment and utilisation in the country.

Now the exports of soap amount to nearly a crore of rupees, all of which might be produced in the country from cotton seed which is at present wasted in large quantities.

In the manufacture of soap large quantities of glycerine might be obtained as a valuable by-product for export and which to a great extent would cover the cost of manufacture. The oil cake also is to be taken into consideration which would provide a very valuable manure and cattle food.

Many soap works, it is true, have been started but the matter has not yet been taken seriously in hand on large scale.

THE ALUMINIUM INDUSTRY

THE principal raw material or ore of aluminium now used *viz.*, Bauxite, occurs in vast quantities in the Central Provinces and to a lesser extent, in many parts of India. The largest and richest Bauxite deposits of the Central Provinces are in Balaghat and Jubbulpore districts, those of the Jubbulpore

district being the richest and most readily worked, as they are mostly within a few hundred yards of the railway line, while those of Balaghat although containing a much larger quantity of ore are not so readily workable, the nearest deposits being about fourteen miles from the railway.

Bauxite is a hydrated oxide of alumina, containing a certain amount of impurities, such as iron oxide, silica and titanium oxide. The average Indian Bauxite contains anything from 50-60 per cent of aluminium oxide, 20-30 per cent of water, 0.5-4 per cent of silica, 1-6 per cent of iron oxide, and 5-10 per cent of titanium oxide. Bauxite to be employed in the manufacture of aluminium should be as free as possible from silica, which is the case in the best Indian ore.

In the manufacture of aluminium metal, the first step is to obtain pure alumina from bauxite, which is accomplished by treating the latter with a solution of caustic soda; the pure alumina is then reduced, by means of carbon in an electric furnace, to the metal.

For every ton of aluminium produced per annum some 4 to 5 electric H P are required, therefore it is only possible to produce this metal where cheap electric power is available.

The present annual demand for aluminium in India is about 2,500 tons, all of which is imported, but taking into consideration the future needs for Government purposes, it will amount to at least 12,000 tons, in the course of the next five years. Many schemes are now in hand for developing hydro-electric power, in the Bombay Presidency. Should cheap power be obtained in large quantities, aluminium may be manufactured in the country, to meet all present and future requirements.

THE CEMENT INDUSTRY

AN industry has sprung up in the fabrication of Cement of late years at an extraordinary rate. Many attempts were made to start Cement Works in the country for the past thirty years or so, but it was not until the Katni Cement Works started in 1914 that any considerable success was obtained in this line.

Vast quantities of Cement are required for public works, buildings, and other similar constructions, such as railways, irrigation works etc, and as the raw materials required for the manufacture of Cement viz., limestone, clay and coal can be had in abundance in almost every province, there is every hope of India being totally independent of all foreign supplies, in the course of the next few years.

The following figures show the present position of the Cement Industry and it will be seen that India is now producing roughly two-fifths of her present requirements.

Cement Imports				
YEAR				
1911-12	1912-13	1913-14	1914-15	1915-16
TONS				
116,950	160,514	146,578	144,972	131,645
VALUE IN RUPEES				
34,96,665	68,67,170	65,83,965	67,33,980	70,55,150
Approximate Indian Production of Cement				
Katni Cement Co. Ltd.		5,000 to 40,000 tons		
Bundi Cement Co. Ltd.		0,000 tons		
Indian Cement Co. Ltd.		20,000 tons		
		85,000 to 90,000 tons		
Total say about		tons	90,000	
Imported Cement (average of five years)		tons	140,000	
Grand total			230,000 tons	

The average value of Cement sold in India before the war was about Rs. 50 per ton.

The war has of course to a great extent retarded the importation of foreign Cement into the country or by now, India would be

consuming at least three hundred and fifty thousand to four hundred and fifty thousand tons a year, of a total value exceeding Rs 1,75,000 to 2,25,000. As the cost of manufacturing a ton of cement in India does not exceed Rs 25 it leaves a clear profit of at least thirty rupees per ton on the pre-war price.

The present year's balance sheet of the Katni Cement Co. Ltd., shows a gross profit of over rupees thirteen lacs, accruing from the manufacture and sale of about forty thousand tons of cement (which was sold for an average price of approximately sixty rupees per ton) on a profit of thirty five rupees

per ton. These figures bear out the statement that the manufacturing cost could not have been more than Rs 25 per ton, even at the present extraordinary high rates for coal and other raw materials.

The Cement turned out by the Katni Cement Co. Ltd., is quite as good in quality as the best imported Cement, and as there is abundance of raw material available in the country, there is no reason why India should not in the next few years be quite independent of all foreign supplies. So far Bombay financiers have taken up this important National Industry.

VILLAGE INDUSTRIES IN INDIA

By Mr V R Mundle

THE necessity for the establishment of Village Industries, on a small scale, and the economic advantages derived therefrom by the country at large, and the Villagers in particular are worth the consideration by all true lovers of the country—especially the enterprising Industrialist throughout India. The villagers are required to go to some town, where they could get the necessary articles, which are not obtainable in Villages. They have to pay high prices for the articles bought for them in Town. In order therefore to get rid of these troubles, and to improve the economic condition of the people, it will be to the advantage of the villagers, as well as the promoters, to start Village Industries to satisfy the ordinary requirements of the villages.

In the beginning Indian Capitalists naturally will not be induced to take up this work in view of the laborious task before them and the difficulties they have necessarily to meet on their way. But, they must be prepared to face boldly all such initial difficulties even

at some sacrifice for the noble cause of improving the lot of the villagers from an economic and industrial point of view. The Villagers naturally being helpless and ignorant in the matter of the development of their Industries and their economic effects, may not appreciate it at the outset, the idea of the introduction of Village Industries in certain localities.

Hence, the responsible duty of educating the ignorant masses devolves upon their patriotic well-wishers who take up the cause by holding informal Conferences explaining to them their existing situation—how they can improve it by taking to Cottage Industries, and demonstrating the practical working of a few specific Industries. For the successful working of these Industries organisation on sound business lines is imperatively necessary.

In every Province, there ought to spring up a net work of Industrial Banks organised and controlled by Indian Capitalists whose object should be not merely the accumulation

of profits for themselves, but to anxiously watch and foster the development of the Cottage Industries of the country. The narrow-minded, greedy and selfish Capitalist will be satisfied with the multiplication of his capital at any cost by way of exploitation and exploitation, pure and simple, is his main object. Such a Capitalist will not help, in the least, the development of the indigenous Industries of the land, but will, on the other hand, mar and deter the progress of Industrial development by killing the indigenous industrial enterprise by all possible means. At present, to save the lot of the starving millions throughout the land who have been forced to begging and other objectionable means of earning livelihood owing to the neglect on the part of the leading rich and educated business classes who are supposed to guide the destinies of the "dumb and down-trodden", millions and in the absence of a sufficient number of honest, selfless and co-operative workers to guide them on the economic side of life, the Country demands the organisation of Industrial Banks having branches in every Village throughout India for the purpose of financing the cottage workers on equitable terms to enable them to buy the raw material required for their Industrial needs and to sell their finished products by opening suitable markets for same. If such Industrial Banks are manned by broad minded business men who love their country and its people truly, working anxiously for their economic regeneration with a sense of genuine patriotism, it is a double blessing, a blessing to such Industrial Banks as well as to the villagers. It will not only prove profitable to the Banks financing the Industries but also lead to the prosperity of the cottage workers.

The next point for consideration is what are the Village Industries requiring financial assistance? The most important of all the

industries requiring immediate attention is the handloom weaving industry. To improve this industry, each Village must be supplied with an Oil Engine with some gins to gin the Cotton, a few Yarn-making machines and Hand-looms. To manufacture coloured cloth, the promoters can introduce dyes extracted from vegetable materials. To utilise the power of the Oil Engine, allied industries can be started such as Oil Industry by which Oil can be extracted from vegetable matter such as copra and oil seeds, the Oil extracted being utilised for consumption in the villages, and the Oil cake used as cattle food. The surplus oil can be consumed for the manufacture of Soaps to be used by villagers to clean their cloths.

The Village Industrial Banks will act as Bankers of villagers' deposits, and also of the industrial concerns in the villages. The benefits from the village industries are that the villagers will not be required to seek the way of a Town, and they will get the articles required for their daily use much cheaper than the articles bought from a town.

Labour is the third item that demands the attention of the promoters of the village industries. In villages, the amount of labour can be obtained on duly wages. The village Labour is generally cheaper than that of the Industrial or ordinary Commercial Towns, but it is unskilled labour. They can be turned into skilled labourers in due time. For these small village industries, much labour will not be required.

With a view to obviate difficulties in controlling Industrial organisations and the branch Banks, the District Industrial Bank will open branches in suitable centres in each Taluk for a group of villages forming one unit.

Great attempts have been made by many persons to establish Co-operative Credit Societies in large Towns and Villages to enable the Farmers to raise loans, on sound

security to improve their fields and thereby to raise the economic condition of the Agriculturists

In the same manner, the true Industry-loving people should exert themselves, with the co-operation of Government, if required, to promote these useful District and Village Indus-

trial Banks, and the Village Industries for the benefit of the poor villagers, and the country at large, and remove the distress and poverty under which they are labouring. This aspect of Industrial organisation should not be lost sight of by Indian Capitalists and promoters in these days of growing business enterprise.

COMPANY MEETINGS.

The United India Life Assurance Co. Ltd.

THE 14th Annual General Meeting of the above Company was held at the office premises, Explanade, Madras, on the 29th May last when the Report of the Directors for the year 1919 was presented to the shareholders. The holding of the General Meeting this year appears to have been unusually delayed.

The Report of the Directors shows that substantial progress has been made. During the year under review, 743 Proposals were made to the Company for assuring sums amounting to Rs 12,48,000 as against 497 Proposals for Rs 8,12,750 in the previous year. Of this number, 572 have resulted in Policies for Rs 9,00,250 and the remainder have either been declined or withdrawn or are awaiting completion. The annual premiums on the policies effected during the year amounted to Rs 43,952-9-0 as against Rs 28,115 14 0 in the previous year. The Life Assurance Fund at the end of the year stood at Rs 5,23,141-13-9 as against Rs 4,18,616 4-8 in 1918. During the year 67 policies lapsed, the policies in force at the end of the year being for the value of Rs 32,63,804-2 0 of which Rs 36,500 are re-insured. The Revenue derived from premiums, interest, and other items amounted to Rs 1,82,776-7-8 for the year while the out-go for the year, exclusive of claims, surrenders, depreciation and dividends etc., amounted to Rs. 28,151-2-3 which

includes only Rs 290 2 9 on account of advertisement. Since the establishment of the Company, Rs 1,43,885 1-0 have been paid in satisfaction of claim. A dividend of 4 per cent was declared for the year under review.

The Directors' Report is accompanied by copies of the Audited Accounts and the report of the Auditor Mr M K Dandekar, an Incorporated Accountant, showing that he has personally examined and counted the documents relating to the investments. The assets of the Company on the date of the Balance Sheet amount to Rs 6,65,478 15 0 of which over Rs 6 lakhs are invested in Deposits with the Controller of Currency, Indian Government Securities, Indian Municipal and Provincial Securities, Indian Railway shares, Fixed Deposits in Banks and loans on the security of the company's policies, besides balances on current accounts.

From the Report and accounts presented to us for review we have no difficulty in concluding that the year 1919 has been a very notable one. In the matter of new business, the company's figures constitute a record far in excess of anything attained by the company during the past years of its existence. It is hoped that the company will, in future years, continue to maintain this remarkable progress. The rapid development in the Life Assurance business, may be attributed to

the tendency on the part of the people to regard life assurance as a necessary investment, in view of the influenza and other epidemics and the conditions of uncertainty prevailing in the country both during and since the war.

From the foregoing figures, the ratio of expenditure to the premium income is as low as 18½ per cent. Another favourable feature is that the Amount of Life Assurance Fund has increased during the year by over one lakh of Rupees. Thus, it is a matter of great pride and real satisfaction that, the Directors, while reporting a very large increase in the new business record and in spite of advanced costs all round due to abnormal conditions during and since the war, have succeeded in maintaining the total of the outgoings in the direction of expenses of management and commission at the lowest possible minimum. The insuring public ought to take note of the fact that economy of management, consistent with full efficiency, continues to be a remarkable feature in the administration of this company whose sole aim evidently is to promote the best interests of its policy holders. It should be candidly admitted, in this connection, that there has been current in certain quarters an idea that the company is very conservative, cautious and careful, and even at times overcautious in certain respects such as organising more and more branches through-

out the length and breadth of India and abroad, and in sanctioning increased allotments in giving wider publicity and the like. But, we leave them there for the present and hope that such matters will have the prudent consideration of the Board of Directors both in the best interests of the company and the insuring public. The thoughtful proposers for insurance all over the country are always on the look out for the best form of investment and it is the business of every enterprising insurance company to be always at the forefront by the adoption of suitable methods of publicity to reach the insuring public. The phenomenal increase in the new business enterprises all over the world and the considerably increasing prosperity in the new business achieved by several foreign Insurance Companies due to their transacting a considerable amount of business in this country by the adoption of modern methods of publicity and organisation must be an eye opener to every indigenous Insurance concern.

In conclusion, we congratulate the Board of Management of this company—the only institution of its kind in the Southern India with a purely Indian Directorate whose Chairman is Dewan Bahadur K. Krishnaswami Rao, C.I.E., to whose initiative and sound guidance the company owes its present prosperity.

THE TATA INDUSTRIAL BANK LTD

The second ordinary general meeting of the Tata Industrial Bank, Ltd. was held at Naxos Buildings, Bombay on the 31st May 1920. Mr. A. J. Bihimoria presiding in the unavoidable absence of the Acting Chairman, Sir Dorab Tata, from Bombay. The paid-up Capital stood at Rs. 1,51,19,321-4-0 on the 31st December 1919. The Demand and Fixed Deposits stand at Rs. 9,31,27,031-8-3 which show the steady and satisfactory expansion of the business. Cash on hand and with Bankers stands at the satisfactory figure of Rs. 2,31,04,400 as compared with the de-

mand liabilities of Rs. 4,12,85,483 or at 56 per cent. Investments in Indian, British and other Government securities amount to Rs. 2,01,55,719 and Bills Discounted, Advances and Loans Receivable to Rs. 6,80,74,629. After writing off the preliminary expenses and brokerage account and placing Rs. 5 lakhs to the Reserve Fund, a dividend of 12 annas per share free of income tax was declared, a balance of Rs. 3,08,324 being carried forward. There are about 30,000 share-holders. The result of the year may be considered satisfactory.

THE POSSIBILITIES OF AGRICULTURE IN INDIA WITHIN THE NEXT TWENTY YEARS.*

By Mr D Clouston, C I E, M A B Sc, Director of Agriculture, Central Provinces and Berar

I HAVE to extend to you a hearty welcome to the meeting of the Agriculture and Applied Botany Section of the Indian Science Congress. I very much appreciate the honour of being asked to preside over this section. The subject on which I am to address you is one which will, I trust be of interest to many here. For most of us are beginning to realize how potent a factor science is in the development of India's greatest industry—Agriculture.

It has been said that in the career of a department as in the life of a man, there are stages from which it is appropriate to take a glance backward and contemplate the outlook of the future. Prophecy being the role of science I am to play the part of a prophet on this occasion in so far as I shall in the light of the progress already made in developing agriculture in India try to give some indication of the rate of advancement to be looked for in future.

At the present stage of advancement a study of the history of agricultural development in England where many of the difficulties were experienced which we are up against in India to-day, may prove helpful. Till the latter part of the eighteenth century the agricultural unit in Great Britain was the village with its scattered holdings, common grazing grounds, half tilled cult and poor crop resulting from bad cultivation which are so characteristic of many parts of India at the present day. Many improvements had been introduced before that time, the more enterprising farmers had learnt for example, how to grow turnips, clover, artificial grasses and other fodder crops, how to avoid the need of fallows by adopting suitable rotations and how to grow crops in line by using seed drills for sowing and hoes for interculture. These improvements were however, not generally adopted for many years because of the difficulty of protecting such fodder crops in villages which had not been enclosed.

The Napoleonic wars and the rapid development of our manufacturing industries in the latter years of the eighteenth century and the early part of the nineteenth gave a great impetus to English agriculture by forcing up prices of farm produce. High prices, coupled with a rise in the cost of labour, encouraged the use of labour saving appliances and the production of larger acreage

outturns. The open field system of scattered holdings with its bad cultivation which resulted therefrom began to give way slowly before economic pressure and the more intensive methods of farming which began to be adopted by the leading 'gentlemen' farmers of the land. Consolidated holdings were formed and the cultivation of turnips, clover and other new crops which were to revolutionize farming were taken up on a larger scale than ever before. Progress, however, was not so rapid as it might have been as most of our English farmers of this period, like their fathers before them stuck to their empirical methods based on old use and wont, for there was as yet no science of agriculture which could be applied to the solution of its manifold problems. Such advancement as was made in those days can be directly attributed to the interest taken in improved husbandry by men like Jethro Tull, Bakewell, Ford Townsend and Arthur Young who, though not themselves scientists, in our sense of the term possessed the scientific habit of mind which they brought to bear on the agricultural problems of the day.

Science began to be applied systematically to the development of the agricultural resources of England about the middle of the nineteenth century, and with very beneficial results. By better breeding and better feeding, better breeds of cattle, sheep and horses were improved out of all resemblance to their progenitors. Great Britain became the world's end for a labour saving machinery and better methods of cultivation were rapidly introduced and improved strains of seed raised. More attention was given to the improvement of the soil by drainage and manuring to the protection of crops from cattle, and to the better housing of live stock. As a result of the improvements effected the average yield of the staple crops and the average weight of cattle and sheep were more than doubled. These and other improvements introduced in the latter half of the last century have added largely to the material welfare of the English farmer. Development would have been much more rapid however had her statesmen fully realized the enormous possibilities there were of agriculture being benefited by experiment and research. For the splendid progress that was made we are largely indebted to the great work done by scientists like Lawes

* Presidential Address to the Agricultural Section of the Seventh Indian Science Congress, Nagpur, 1920

and Gilbert to enterprising seedsmen like Garton and Sutton, to the ingenuity of manufacturing firms which vied with each other in designing machinery suitable for the farm and to the fine example of the larger farmers who were in a position to utilize to the full the modern developments of organization and scientific knowledge.

As a result of the exigencies of the great war now happily ended, scientific enquiry in all branches of industry has, since 1914, been stimulated to an extraordinary extent. Never before has the value of agricultural science had such recognition. Statesmen and the public generally have come to realize the paramount importance of providing for the endowment of work connected with the development of agriculture on a scale commensurate with its great importance because they now see, as they never did before, that 'the countries which have made the greatest progress and which obtain from their soil the highest returns are those which have increased their research institutions. Denmark was obliged to do so after her defeat by Germany in 1863 and has as the result been able to increase the acreage outputs of her staple crops by 24 per cent in the short space of a little over 50 years. Germany, foreseeing the possibility of being blockaded by the British fleet in the event of a war with our country, had for 40 years previous to the outbreak of war, been studiously organizing her institutions for experiment and research in agriculture, with the result that when war broke out, her resisting power came as a most unwelcome surprise to the allies who had hoped to starve her strength by starvation.

Let us now consider the position of agriculture in India and the possibility of our benefiting from the experience gained in other countries. The economic conditions which obtain at the present time in India resemble in many respects those which stimulated agriculture in England in the early part of the nineteenth century. A great war has again forced up the prices of farm produce to an abnormal figure. The industries of this country are being developed with phenomenal rapidity. The cost of farm labour is rising and will continue to rise for the new industries will continue to draw workers from rural areas. If they are to take full advantage of the golden opportunities which are now offered them, landholders in this country will have to use labour-saving machinery on a much larger scale than formerly, and they will be obliged to adopt more intensive methods of cultivation all round, involving manuring and irrigation on a large scale. So long as prices remain at their present high level intensive cultivation will pay handsomely. Manures, for instance which were applied at a loss five

years ago can now be applied at a handsome profit. The present favourable position of the market for agricultural products marks in short the beginning of an era of prosperity for the cultivator if he will but take advantage of his opportunities. He will have, however, to readjust in many ways his system of agriculture. To be successful he will have to put more brains, energy and capital into his work and in this we hope that the larger land owners will, like the 'gentlemen' farmers of England of days of yore, take the lead in restriping and consolidating their holdings and in developing the capacities of their own estates. It will be the duty of the department of agriculture to play its part by placing at their disposal the best possible scientific and practical advice and in the shortest possible time. I am confident that the Government of this country will play its part well, and that the *laissez faire* policy formerly adopted to the detriment of agricultural development in some countries in the West will not be followed by statesmen in India.

Of the value of the work accomplished by the Department of Agriculture in India within the last 10 or 14 years the Indian Industrial Commission has written as follows. The striking financial results which followed quickly and directly after the employment from about 1905 of scientific specialists in agricultural research demonstrate the wisdom of investing in modern science. This is the unbiassed opinion of a body of men who had considerable opportunities of studying the facts on which they based their conclusions. The work which the department has already accomplished is undoubtedly adding annually to the farming profits of the country a sum which exceeds its total annual expenditure many times over. The rate of advance moreover is likely to be very much greater in the near future than it has been in the past, for we now have a background of exact knowledge available which gives us a most useful basis for future progress. We have behind us, moreover, an enlightened government which has set its seal of approval on the work already accomplished and which has determined to make ample provision for further expansion.

The achievement which has perhaps appealed most to the public is the introduction of superior varieties and strains of seed of the principal staple crops. To take only three of these namely, cotton, wheat and rice, there is reason to believe that approximately two and a half million acres of improved varieties of cotton and one each of wheat and rice, are already being grown. If the extra annual profit accruing from the cultivation of these were only two rupees per acre even, it would

mean in the aggregate a total extra profit of approximately 90 lakhs of rupees, which far exceeds the total annual expenditure on all the departments of agriculture in India, but the actual extra profit from the introduction of improved varieties of these three crops is at least four times the amount which I have stated. This, moreover, is only a fraction of what has already been achieved for the activities of the department now extend over a wide field including not only crop improvements but the introduction of better and more intensive methods of cultivation all round. The introduction of a one per cent improvement here and a two per cent improvement there in the aggregate, adding largely to the wealth of the cultivator and enabling him for further progress. It is evident from what has already been accomplished that the department should within twenty years be in a position to introduce improvements which will add many crores of rupees annually to the farming profits of the cultivators.

The extent to which future progress can be guaranteed will very largely depend on the measures adopted by the Government of this country to secure an adequate staff of first class specialists in agriculture and the sciences allied thereto. We want the very best brains which the Universities of the West can turn out to help in the solution of India's agricultural problems and to help in training Indians for the great work. Nor should time be wasted in getting these foreign train research men and original experimenters. Effectively takes many years and such men even when fully trained cannot reasonably be expected to produce results till after years of careful investigation as a rule. Owing to the present shortage of staff our work is being carried on under great difficulties, and progress is retarded thereby. The value of the improvements already effected by a small staff has no doubt been surprisingly great, but let us not forget that up to the present we have tackled only the most obvious lines of improvement. We have merely scratched the surface so to speak for the new knowledge which is to add tangibly to the profits of the cultivator we shall have to dig deeper. We have not as yet, for instance, given much attention to the question of cattle improvement by better feeding and breeding. Personally I am of opinion that this is one of our most hopeful fields of investigation and I am confident that wonderful improvements can and will be effected within the next twenty years.

Much has already been accomplished in the way of improving the staple crops of the country by selection, and hybridization, and this has paved the way for further improvements by better tillage methods and manuring

but for better cultivation we require better implements. Some thousands of improved ploughs, cane mills and other implements are now in use in rural India but the existing demand is, I am sure, a mere fraction of what it will be in the near future. It is the duty of the department to see that this growing demand is met satisfactorily. It is its duty, too, to assist manufacturers in devising suitable implements, to induce agricultural associations and unions to start depots for the demonstration sale, hire and repair of types suitable for the tract for which they are required and to assist purchasers in setting up plants if necessary. But here again we are at present handicapped for want of a staff of specialists. Some provinces have not yet obtained the services of an Agricultural Engineer with the result that duties which ordinarily fall to such an expert are entrusted to Deputy Directors, very few of whom have had any training in Mechanical Engineering. We urgently require for each province an Agricultural Engineer to help to devise and set up improved types of agricultural machinery and to get implements of the type required manufactured on a large scale in this country.

Much of the cultivated land in India has almost reached the maximum state of improvement, a great part of the cattle manure which ought to go back to it, is burnt as fuel, and other valuable manures have not yet been used extensively. Indian soils over large areas have thus been starved for centuries and are hungry and therefore very responsive to manuring. It is largely due to the judicious application of water and manure that the crops obtained on Government farms are so much better as a rule than those of cultivators in adjoining villages. The testing of green manures, oilcakes, bones, fish, mineral manures etc. and the study of their relation to bacterial life in the soil have been started. The result already obtained indicate the great need there is of inducing the cultivator to do everything in his power to conserve his farm yard manure and to supplement it by using the available manures such as bones, oilcakes and green manures. In this the department can and is giving him valuable assistance by advising him as to the kinds and quantities to apply and by helping him to organize depots for the sale of manures which can be used economically. It can assist too in establishing fuel reserves for the supply of fuel to villages, for want of such reserves cultivators over the greater part of India are compelled under existing conditions to use the dung of their cattle for fuel. There is no other course open to them at present.

The damage done annually to our staple crops by fungal diseases and insect pests is enormous. Here again we have a promising field of investigation which for want of staff, we have not as yet been able to explore at all fully. Much has been done no doubt in the way of studying the life-histories of these diseases and pests but with the limited knowledge at our disposal we are not yet in a position to recommend remedial measures except in a very few cases.

The conditions for fruit growing in India are most favourable, and the subject is now beginning to get some attention from the department but here again for want of experts in fruit-growing the work is at present relegated to men who have no special knowledge of the subject. The whole field of agriculture, in short, is still bristling with unsolved problems which cannot be investigated effectively for want of trained specialists in the different branches of agricultural science involved.

The degree of specialisation and of intensive concentration required for sound research in the different sections of the department is not possible at present. The chief of the average Deputy Director of Agriculture to exemplify is so busy and his duties so manifold that he can devote only a small fraction of his time to experiment and research without which real progress is impossible. From the results already obtained by our botanical experts, who have devoted attention to the improvement of the staple crops, there is but little doubt that it would pay handsomely to employ in each province a sufficient number of first class botanists to deal with all the more important crops and the number of crops allotted to any one man should not ordinarily exceed two. There are undoubtedly problems enough in each province to occupy the whole time of several such men. To put one man in charge of more work than he can do efficiently is in short false economy, and this applies not only to Deputy Directors and Botanists but to other experts as well. In every section the men employed are too much distracted at present by the great variety of problems which they have to tackle. So long as we are understaffed moreover it will be impossible for experts to give their assistants the specialised training which is so necessary in the interest of efficiency. Farm Superintendents should for example be trained in experimentation, plant improvement and other lines of work entrusted to them before they are put in charge of experimental stations and the men to be put in charge of demonstration and organization work should similarly be specially selected and trained for that class of work.

If we neglect to make adequate provision for experiment and research, we shall sooner or later find ourselves in the position of having nothing new to teach the cultivator, if given an efficient staff on the other hand there is reason to believe that it will become increasingly easy to get him to adopt our teaching, for as a result of the work which the department has already accomplished his confidence has been gained to some extent and he is now more willing than ever he was to make use of new ideas. To get that teaching adopted in the shortest possible time, we shall require many more government farms and a more complete district organization including taluq agricultural associations and unions working under the guidance of the department. Each taluq or tahsil of a province should have its own government farm to which cultivators could come for help and advice. From these farms they would get their supplies of improved seeds, manures and implements and agricultural literature of interest to them might also be stocked there. The taluq farm would be the centre for the meetings of the taluq agricultural association and for agricultural shows. It would be the centre too for agricultural education. Each farm might have its own agricultural school where the sons of landholders could be trained in the practice and principles of agriculture. The villages of the taluq might be divided into groups of ten or more each group constituting an agricultural union which might have its own co-operative shop or depot for the supply of seeds, implements, manures, agricultural literature etc. The taluq agricultural association would consist of the office bearers of these agricultural unions, while the members of the agricultural union would be the representatives of the ten or more villages included in the union. These unions would arrange for the sale and hire of implements in the villages and for the sale and distribution of other articles stocked in their depots. Each village of a union might have its own seed farm, its own stud bull or bulls, and its own fuel reserve. To control this organization efficiently it would be necessary to have a managing committee for each district with the Deputy Commissioner as chairman and the Deputy Director of Agriculture as agricultural adviser. The non official members of the committee might consist of representatives elected every year by the taluq associations. The duty of the committee would be to define the policy to be followed by the taluq associations and unions controlled by them and to allot funds for the demonstration work carried out by the unions. In order to provide money for this work each union could be called upon to contribute part of its profits to a general fund. District and

many agricultural agencies organized in this way would be the medium through which legislative measures for the advancement of agriculture and the amelioration of the people would be carried out. Through these agencies one or more model villages with consolidated holdings, sanitary houses, schools, trim fences and serviceable roads could be laid out and run as object lessons for the whole Taluq. A system of demonstration and co-operation run on these lines would, I believe, help to break down the barriers which at present stand in the way of progress.

In conclusion, I would ask whether it is too much to expect that within twenty years the department if adequately staffed will by patient concentration and intensive investigation have accumulated a body of knowledge in every branch of agriculture which may benefit India to the extent of many crores of rupees annually. And is it too much to expect that, by working

with and through the people, it will be possible to get them to apply that knowledge? In the past the department has had its successes and its failures, but its successes have been far greater than Provincial Governments ever anticipated. An era of still greater accomplishment lies ahead of us. Our successes of the future will, I am confident, surpass our highest expectations. The great task of reconstruction which lies before us is well worth all the energy and brains we can put into it, for on the development of her agriculture depends not only the prosperity of India's many millions of agriculturists, but to a great extent the lot of those engaged in other industries dependent on agriculture. Increased production will help to banish famine and poverty from the land, and to bring us near the realization of your hope, namely to make India a garden ringing with cheerful and contented life with smiling fields and food in plenty.

INDUSTRIES

THE IMPROVEMENT OF FRUIT PACKING IN INDIA

THE Imperial Economic Botanists at Pusa have contributed the following article to the *Agricultural Journal of India* -

When the Quetta Fruit Experiment station was established in 1911, one of the main items of the programme of investigations was the best means of improving the packing and transport of the fruit produced in Baluchistan. The earlier results were published in 1913 in Bulletin No. 2. A second revised edition was printed in 1915 and during 1919 a third edition has been called for. In the present paper it is not proposed to repeat the contents of these bulletins but to direct attention to the main results obtained and to refer briefly to certain general principles which have emerged from the work.

Improved fruit boxes were first placed on the market at Quetta in 1912 when the sales reached Rs. 700 in value. The demand rapidly increased during 1913 and 1914 and in 1915 boxes to the value of Rs. 5,000 were sold by the middle of the season, by which time the available stocks had disappeared. During the three succeeding years, 1916-18, the provision of adequate supplies became difficult due to high prices, to the shortage of timber and to the railway restrictions in force throughout India. The work, however, was continued and the sales reached Rs. 8,000 during 1919 although the stock of the popular non-returnable crates was exhausted early in the season.

In 1919 the Frontier fruit trade laboured under many disadvantages. The war with Afghanistan was in progress and for a time the supply of Kandahar fruit stopped altogether. The border was disturbed, raids were frequent, and delays on the railways were unavoidable. That the sales of fruit boxes reached the highest point under such adverse circumstances speaks for itself.

Two railway concessions have proved of material advantage into the introduction of modern packing methods among the fruit dealers. In 1916 the Railway Conference Association agreed to our proposals that all parcels, including fruit, should be grouped for purposes of charge and that four types of returnable boxes, recommended by the Fruit Experiment Station, should be returned free from all stations in India to Quetta and Chaman. These concessions are now being very generally utilized and they have greatly stimulated the use of the 24-punnet returnable grape crates and of the cardboard peach boxes.

Seven types of fruit boxes are now on sale at Quetta. For peaches, nectarines, cherries, apricots and plums, three sizes of compartmented cardboard boxes have become popular. For the grape trade the 24-punnet is the unit adopted. These are set up in crates holding 8, 16 or 24 punnets arranged in tiers separated by lattice floors.

About a thousand of these returnable crates were sold during 1919, the retail price being Rs 5-8 each. This is a high price to pay for a fruit box considering the fact that the ordinary baskets and boxes in use can be purchased for a few pence. The dealers readily pay cash for these expensive crates and the only difficulty is to assemble sufficient to meet the demand. The advantages of packing the grape crop direct into punnets in the vineyards are now being recognized and the large returnable crates supplied by the Fruit Experiment Station are a common sight on the roads leading to Quetta. Already the larger dealers are considering the question of getting this type of package introduced into the vineyards of Kandahar.

There is no reason why the returnable made standardized returnable fruit package should be confined to Baluchistan. The principle could be easily adopted in the North-West Frontier Province, in Kohistan, in Kulu-Kumail and in other parts of India. The Railways have shown their willingness to assist by means of valuable concessions. The efforts made to improve fruit packing in Baluchistan and there is no reason to suppose that equally effective assistance would not be given to other fruit growing localities. The non-rigid type of fruit package of the basket type is not adapted for long journeys under Indian conditions and its place should be taken by returnable boxes and crates by which the carrying capacity of the railway vans can be greatly increased and by which the traffic can be more easily handled. By such methods the product reaches its destination undamaged and therefore commands an enhanced price.

Our experience in removing the disadvantages under which the fruit trade in Baluchistan formerly laboured and in establishing modern methods of fruit packing has brought out two things—the rate at which time-honoured practices and ideas change in India and the importance of time and patience in implanting a new idea. When in 1911 we commenced these investigations, we were told on all sides that cheapness was the

first condition of success in placing new packages on the market. We were constantly reminded that the grape baskets and old kerosene oil boxes then in use were cheap and that they could be purchased for very small sums. When the 24 punnet returnable grape crates were first brought to the notice of the dealers, they were considered too expensive and altogether unsuited to the conditions of the local trade. A few of the more advanced merchants, however, agreed to try them. The grapes were found to travel perfectly even to places as distant as Madras. A change in the attitude of the trade then began to make its appearance. A demand from the more advanced cities like Bombay that Baluchistan grapes should be packed in punnets followed and from that time success has been assured. The difficulty has been to meet the demand rather than to sell the crates. Nothing is now heard about the cost.

Time is a factor in India in the introduction of new methods to which an efficient attention is often paid. This is specially important where trade is concerned. Dealers of all kinds, my little business and practically all their working hours are spent in details connected with purchase, sale and finance. Particularly is this the case with the Frontier fruit dealers whose output of work during the fruit season considering the means at their disposal is extraordinary. They have absolutely no time for experiments or for anything else beyond the day's work. For such men, patience is essential and they must be given ample time for new ideas to sink into their consciousness.

This experience proves that too much attention can be paid to the ideas of the people of India towards new methods. They are apt to be frankly sceptical at first and to exhibit that conservatism which is so valuable in protecting the race from disaster. The inventor must therefore be prepared for this and when he is fortunate enough to discover a real improvement and the only thing possible under the circumstances, he should resolutely persist in keeping it before his public year after year.—*The Indian Trade Journal*

INDIA'S INDUSTRIAL PROGRESS

At the second ordinary general meeting of the shareholders of the India Industrial Bank Ltd held at Bombay on the 31st May 1920 Sir Dorabji Naik's address was read from which extracts are given below:—

Trade of India. The external and internal trade of India has been good and according to the published figures our Exports of Merchandise during the last Official Year exceed our Imports by over Rs 100 crores. These figures are all the more remarkable when the

embargo on the export of food grains is taken into consideration. We have been faced with high prices and of late the cost of living has risen by leaps and bounds and now approximate conditions which have existed for quite a time past in other parts of the world. With the increase in prices industrial unrest has developed and we have had strike after strike extending pretty well all over India. I am the last to suggest that industrial unrest necessarily means an evil day for this country, Labour and Capital must live and let live and in such

tration and the setting up of Conciliation Boards all over the country we have the surest method of bringing the opposite points of view together.

Money—The course of money for a long time showed no extraordinary fluctuations but during the past two months money has become very tight. It was a curious time at the height of our Cotton Export Season for Government to contract the note issue and this contraction if persisted in on the same scale would have precipitated a crisis in India.

It is to be hoped that this policy of contraction will not continue. Any increase in the note circulation has been backed either by coin or by gilt edged securities and under the impulse of War conditions and high prices it was only natural that our note circulation should increase in volume as it has done. Now Government retain the right to issue emergency Currency during periods of seasonal trade activity but I think the basis upon which such issues are to be made is subject to criticism. In America the Federal Reserve Board do not fix an interest limit of 8 per cent before such emergency issue can be made and this country and America in some respects are closely akin. For example both countries are in the main the agricultural countries, this country is cut to extend and create further manufacture and in this sense plenty of inspiration from the achievements of the United States of America. Both countries are large countries. I would suggest that the present system should be modified and brought into closer relationship with that prevailing in the United States of America and that when trade is brisk these emergency notes be issued against Inland Bills and not Foreign Bills as recommended by the Currency Commission.

Currency Report—I would say a word in passing on the Currency Report which was awaited with such interest by the public of India. I am not concerned with the policy or the various steps taken before the issue of this Report. During the War India was a partner in the Empire, and if she suffered unduly from the point of view of her finances by being such a partner, I would repeat that she cheerfully sacrificed her interests for those of the Empire as a whole for the ideal of Liberty for which the Mother-Country and her Allies were then fighting.

The Currency Commission were requested to report as to how Exchange might be stabilised and since the issue of this Report and during the past few months I suppose Exchange has never been more unstable. It appears to me that the Selling of Reverse Councils and the artificial forcing of Exchange rates up into the

neighbourhood of 2s 10d was not in the best interests of this country. Water will not flow uphill and there is a limit to the interference with the normal course of trade. I deprecate the gradual frittering away of India's Sterling resources more particularly when stability, for which we seek and pray has not been the outcome of these offerings of Reverse Councils on London. I also think that a 2s Gold Rupee may defeat the intentions of its advocates. There is a level at which export must suffer in the long run and high priced monopolistic export may induce embargoes and a challenge to their supremacy—other countries are busy trying to reduce inflation of prices and with this deflation may come a period when our export will suffer from the limited demand from other countries.

Imperial Bank of India—We welcome the proposed inauguration of the Imperial Bank of India representing the combination of the three Presidency Banks. We express a hope that the new Government Policy will result not in increased competition in Commercial and Industrial Banking but the setting up of the machinery to discount trade bills endorsed by responsible Banks. Even in our short history there have been times when we felt the necessity of a Central discussing Agency if trade is to go on smoothly and we are to do the maximum amount of business for our clients.

Before leaving this subject I voice the hope of many Indians all over India when I express the wish that it may be possible to have at least four Indian Directors on the Head Board of this amalgamation of the Presidency Banks.

Banking Legislation—There is another feature to which I invite Government attention and that is the introduction of a system of Official inspection of all Banks. The Banking Act of 1913 resulted in the shake out of a number of weak banking institutions but when all is over there is always a tendency for mushroom Banks and Companies to come into existence. When they collapse they inflict harm upon the older and more carefully managed institutions. They destroy confidence in the Depositor and in fact they put back the Banking side of a country's development by a number of years at least. I am told that the reason that Government have not gone further with this matter is because of the difficulty of defining a "Bank" and no doubt they have in mind the numerous Indian Bankers who carry on Shroff Business. May I suggest that such a difficulty might be got over by restricting the inspection to Banks registered under the Joint Stock Companies' Act

Such legislation admittedly would be of great service to the business community and I respectfully urge that this matter be again taken up and pushed to a speedy conclusion.

Industrial Flotations —The country has been passing through a boom of Industrial flotations such as never occurred before. There has been an enormous amount of money for the time being investment and stimulated by the larger profits which in recent years have been made by existing undertakings, many new projects have been launched. It cannot generally be said that they have been undercapitalised, but the investigations we have made lead us to think that the difficulties regarding expert staff and trained workmen have been underestimated, whilst inadequate account has been taken of the rise in the cost of plant and the inordinate delays in getting deliveries. We have, therefore, had to adopt very cautious policy in our underwriting business.

Board of Industries and Munitions —The report of the Indian Industrial Commission emphasised the paramount necessity of rendering India industrially more self-sufficient and strongly advocated the establishment of an Imperial and Provincial Industrial Department. We welcome the appointment of Sir Thomas Holland as President of the newly constituted Board of Industries and Munitions as the first fruits of the policy which his Commission recommended, but we have at the same time to face the fact that the political situation has very materially changed in the last 12 months. Industries have been made a transferred subject and their development or otherwise is now entirely a local matter which will be under the control of the Ministers and the Government of India and the Imperial Officers will be able to do little more than offer advice and secure to some extent co-ordination between the Provinces. Already considerable discussion has arisen regarding the establishment of Imperial, Industrial and Scientific Services, due I think largely to lack of appreciation of the difference between a Service and a Department. I cannot here go into the merits of the controversy, as it is a very complicated question, but we have definitely come to the conclusion, which I think it is well we should not conceal, that without the creation of some such organisation as implied in these proposed "Services," it will be extremely difficult for us in India to obtain the help we shall undoubtedly require from Government if we are to pursue a continuously active development policy. The men we shall need must have local knowledge and experience, and this they will be able to acquire in the proposed "Services." I sincerely

hope from motives of economy these Services will not be understaffed as we hope to borrow from them. That we should be able to do so is the strongest argument for their creation, and I think this should always be in the fore-ground when questions relating to the provision of scientific assistance to Indian Industrial development come up. Hitherto the educated youths in this country have not displayed any great eagerness to accept the prospects offered by Industries, but it is necessary that they should do so and that inducement should be held out to that end. It can no longer be said that India is a poor country requiring capital from outside to develop its resources. At last that great difficulty has been overcome and not only is Capital now available in sufficient amount but it is likely to increase steadily with the development of Banking facilities which provide for its mobilization.

The necessity for Technical and Industrial Training —It would perhaps be unwise to make any definite statement regarding the extent to which a change is coming over the habits of our people but there is no doubt that banking deposits are rapidly increasing. All this is to the good but progress is greatly hampered all along the line through lack of qualified men to initiate and carry on industrial enterprises. Above all, we want men of the mechanical engineering class, more fitters, mechanics and engineering tradesmen whilst of specialists in technical trades we have far too few. It is, therefore, to be urgently demanded from the Government that adequate provision should be made for training in all these Branches of Industry. We want more schools associated with our present mechanical workshops and we want besides several Technological Institutes specialised schools of Metallurgy, tanning and leather, manufacture dyeing and bleaching, sugar cultivation and manufacture, sericulture and silk weaving, glass making and blowing, whilst it is time that our great indigenous artisan population should be afforded opportunities to improve their technique and instructed as to the needs of modern markets.

Industrial Banking in India —Conditions under which business is now carried on are far from normal and as Industrial Bankers we have to take long views and pursue a cautious policy. This Bank has been founded to help in the development of our admittedly great resources and though possibly we have not yet realised the sanguine expectations of some of its supporters, we have already behind us a record of work done of which we need not be ashamed. The houses of Agency and ordinary Banks have hitherto financed industries in India with no small measure of success.

and the more highly specialised work which we have undertaken can only come to us *pari passu* with the creation of industrial conditions it is our object to support. The industries, which form the backbone of our modern system, are of a simple type and they involve the investment of but little capital compared with the fluid capital that is required to work. Almost unwittingly a vast amount of industrial business is carried on by India's banks and our investigations clearly prove that the outcry for special Industrial Banks arose entirely from men inadequately equipped by experience and knowledge to run the concern they had started or were in charge of. At the same time it has become evident to us that we need for a very strong organisation of Capital that could promote new ventures on a scale sufficiently large to ensure their success. In addition to remedy the crises of qualified technologists and in consequence able to make complete preliminary investigations we can embark on undertaking beyond the resources of ordinary individuals or corporate bodies in more limited financial resources.

The Sugar Corporation of India Limited. As the result of our endeavours we have succeeded in placing at the disposal of the Sugar Corporation of India it will be possible to carry on operations in all the main sugar growing areas. But the existing Capital is it is quite inadequate to effect the revolution in the industry which we hope to achieve. The object of the Corporation will be to stimulate local enterprise and to provide a nucleus around which local resources may crystallise. The problems to be solved are mainly connected with land and labour and we feel certain that vast improvements can be introduced through the application of Capital to provide for more intensive cultivation and to erect modern mills equipped with the most efficient machinery available. Before the War India was cultivating nearly 3 million acres of cane and importing nearly 900,000 tons of sugar. Last year (1919-1920) the imports had fallen to 482,000 tons but the value has increased from 15 Crores to nearly 20 Crores.

Estimates of the efficiency of Indian methods of extracting the juice from the cane vary from 50 to 67 per cent. Whilst expert opinion considers that by introducing improved types of cane and by adoption of a more intensive system of cultivation the yield could easily be doubled except in a very few areas where already high grade cultivation has been introduced. You are all aware of the high prices which we now obtain for sugar. What the future course of the market will be, I do not venture to predict but it is safe to say that

pre-war rates are not at all likely to prevail again for at any rate many years to come. I should like to conclude my remark on this matter by reading to you a short quotation from the report of the Imperial Sugar Supply Committee of the Society of Chemical Industry:—

'Everything pointed to India as being the place to consider first. It was the last place to operate from quickly while letting all the other places expand as much as they could. Sugar did not seem a thing that in normal time could stand a very long freight. It might pay to grow sugar with a poor yield in a country that was nearer to you rather than in another where the yield was large but where there was a big freight to pay and consequently our lying place might be able to grow sugar for their own want. Despite poor yield, because ship could not bring sugar cheaply to the distant places from a better and cheaper sugar country. But where sugar could be produced more cheaply it could be put on board ship and so be able to stand a big freight, but which might easily be the case of India.'

Obviously the committee looked to India in the future to export sugar and I think we have done as much as we can to bring about that result.

The Industrial Needs of India. The Great War disclosed in an unmistakable manner the deficiencies in India's industrial equipment and the necessity for joint action by the Government and by the people of India to remedy the existing deplorable state of things. We are ready to go ahead. The people are now willing to invest in and uphold their wealth and we see every sign that Government is abundantly *la-sa-faire* attitude and is coming on to assist us in our efforts. It is up to us to clearly indicate what we want. I should like to mention one or two matters though obviously time does not permit me to dwell upon them at any length. First and foremost we want improved facilities for the transport of our merchandise, the perennial shortage of rolling stock an old story which cannot be passed over till it is remedied. Next we want new Industrial centres and an active railway policy framed to alleviate the congestion at our few ports. Looking forward but a few years we see clearly that we require additional outlets for our growing trade and commerce and we recognise that a wise provision should be made to meet the prospective growth of traffic. Industries can only flourish if our labour is contented and happy and that can never be till efforts are made to remove the over-crowding and unsanitary conditions which prevail in some of our great cities. Expansion in some cases is possible, but the real remedy is the creation of new

cities and the reorganization of the railway services to feed them both with food-stuffs and the raw materials of their industries. I will not now detain you with a dissertation on railway rates, but it is obvious that they are largely responsible for the concentration of energy in so few centres. Let me voice another demand which it is necessary we should formulate. That is that there should be a more active irrigation policy in other Provinces than the Punjab. Over the greater part of India, there is a lack of enterprise in this direction and few if any efforts are being made to keep abreast with agricultural progress. Large storage works are essential and the stored water will in not a few instances be available for both irrigation and water power. They will be costly works but if a rational system of charging

for the water is introduced and if close control over its use is instituted, the returns will be ample to permit of the cost being regarded as incurred on what in official terminology are classified as productive works. This leads me to my concluding remark and that is that India is now in a position to finance its own undertakings. A vigorous constructive policy is essential to maintain our position in the world and if opportunities are freely provided the necessary funds will be forthcoming. The value of money must be recognised and less parsimony displayed in the future than has been the case in the past when offering attractions to investors. I cannot help thinking that cheap credit may be too dearly paid for when it means limited credit and consequent stagnation.

INDUSTRIES OF WESTERN INDIA

In his annual report on the industries of Western India for the year 1918-19 the Director of Industries of the Bombay Presidency furnishes some interesting facts concerning the progress and situation of the more important industries of that part of our Indian Empire.

Haul-loom Weaving—With regard to hand loom weaving the report points out that the main work of this section is the demonstration of the use of fly shuttle looms and their introduction among the weavers chiefly through the medium of weaving schools. The only profitable line of advance in the hand loom industry at the present time is the introduction of improved mechanical appliances, as may be gathered from the fact that imported halds, reeds, shuttles and pirns are now in general use in the schools and their advantages over the country made article are sufficient to have induced an increasing demand for them by the weaving population. It is to be noted that warping and sizing machines, although unsuited to the individual weaver, might be used with some advantage by small factories employing a number of weavers.

Glass—Owing to difficulties in obtaining coal and the lack of raw materials the glass factories were heavily handicapped in the earlier part of the year, some few even having to close down and had it not been for the fact that a minimum supply of coal was allocated to those factories which were engaged on orders from Government and public bodies there is no doubt that the industry would have been completely crippled. The report goes on to point out that it is not the difficulty of making the glass but the difficulty of meeting foreign competition with which the industry is faced. Bombay City, where no fewer than six glass factories are now located is far from the Indian sources of sand and coal, and has not

the protection against foreign competition which is afforded by railway freights to a place like Allahabad, which has sand at its door and coal not far distant. A survey of the sands in the Presidency suitable for the manufacture of glass is to be made and a conference was to be held to discuss measures for assisting the industry.

Pottery—With regard to pottery the report states that during the war Mr. Fern (Superintendent of the pottery section of the Sir J. J. School of Art) resurveyed the red clay resources at Kurla for the new demonstration factory and visited the Lakhtar State in Kathiawar to select a fire clay for the manufacture of the bricks required for the furnaces of the new factory. He also visited the Ahmedabad district, where he advised a local syndicate regarding the working of its kaolin deposit and inspected the manufacture for the Irrigation Department, of pipes for land drainage in the districts of Nasik and Poona, and gave advice. A large deposit of china clay in the south of the Presidency is also under investigation.

Oilseed Crushing—The expansion of the oilseed crushing industry virtually depends on the rate at which the Indian agriculturist can use increasing quantities of cake for fodder and manure. India, it is pointed out, possesses ample crushing power to meet all internal requirements of vegetable oil, and failing new internal demands an expanded oil industry must look for new markets abroad. Again, should a better Indian market be established for the cake, new outlets would in all probability arise for the oil, for instance in an enlarged soap industry. The possibility of improving the quality of the oil from village presses might also well be worth investigation.

Casein Manufacture—Casein manufacture is by no means a new industry in the Presidency but it seems capable of technical improvement and expansion. Experiments have been carried out or are still in progress for the production of casein from separated milk by the method employed in France of using an electric current and also in the manufacture of galath. Investigations were begun for the manufacture of casein cement, for aircraft purposes and there are now good prospects of locally made casein becoming the basis of further local industrial development.

Resin and Turpentine—With regard to the oleo-gum resin of *Boswellia serrata* it is pointed out that although the turpentine produced is of good quality the resin is not so good and the gum practically value-

The production of an improved gum might possibly result in the crude resin being exploited with profit.

Bitterns The utilization of the bitterns at Kharaghoda is one of the two or three schemes formulated for the establishment of new chemical industries near Bombay. Some of the objects of the new process are a greatly improved production of magnesium chloride and magnesium sulphate, economy of fuel and the full recovery of bye-product of good quality. The possibility of using the bitterns as a source of bromine is being tested and investigations will also be instituted regarding the possibilities of manufacturing magnesium salts and extracting bromides at Aden. The establishment of a bromine industry within the Empire will probably depend more upon Imperial policy than mere industrial and commercial factors (*Chamber of Commerce Journal*).

FINANCE.

FISCAL COMMISSION FOR INDIA

Total Amount of 'Reverse Council Bills'

Mr. Charles Edwards in the House of Commons last month asked the Secretary of State for India if he would state what was the total amount of 'reverse council bills' sold by the Government of India under the new policy of fixing the rate of exchange on the basis of the London New York rate, and introduced such amount to include remittances paid to the country through the Post Office out of what funds, a payment being made here against such bills, what was the rupee equivalent at which these funds were accumulated and stood in the books, what was the rupee amount now realized by such sales, what was the total loss incurred so far by the Government of India by these sales, and against what was it to be debited.

Rupee Value

Mr. Mantagu replied—The total amount of 'reverse council bills' or sterling transfers sold since February 1920 is about £30,000,000. Remittance through the Post Office during February, March and April amounted to about £2,000,000. Payment against these transfers is being made from the paper currency reserve and from Treasury. The funds held in the paper currency reserve stand in the books at a rupee equivalent of Rs. 15 to the £. These funds as also the Treasury holdings, were laid down in London at rates of exchange varying from 1s 4d to 2s 4½d. The rupee amount realised by the sales of reverses mentioned above is approximately Rs. 23 crores. The precise loss cannot be calculated, as the

funds held in England cannot be earmarked against particular remittances from India, these having been effected as just mentioned at varying rates. Moreover it will in any case be necessary to be recognised by the Currency Committee to reduce the sterling holdings of the Government on the basis of 12 rupees. On this basis the net loss on the sales as measured in sterling, is approximately £7,000,000 representing the difference between remittances at 1s 4d and the rates actually realised by the sales. The net loss incurred by reason of the high rate at which these remittances were effected will ultimately be debited to revenue, which will, per contra, profit by the fact that under the new policy the Government of India will be able to make the remittances necessary for the purpose of meeting their sterling expenditure in this country at a far more favourable rate than was formerly the case. In this connection it may be mentioned that the rise in exchange above the rate of 1s 4d on which the Government accounts have hitherto been based led in the years 1917-19 to an exchange gain on the Government total remittances of about £8,000,000.

Restrictions on Gold Imports

Mr. Lunn asked the Secretary of State for India whether the restrictions on the import of gold into India by the public still continued, and what were the reasons for the continuance of the same, whether Indian industrial and commercial opinion had protested against the continuance of such restrictions, whether, as a creditor country with a favourable balance of trade in her favour, India was entitled to receive in gold the

balance due to her by other countries, and what was the total amount of profit made by the Government of India on their gold transactions.

Mr. Montagu.—There is undoubtedly a considerable feeling in India in favour of a removal of the restrictions which it has been thought necessary to continue in respect of import of gold for the reasons given in the announcement of which I am sending a copy to my Hon. friend. The announcement recognises the removal of present control as an objective of currency policy in India. The question of profit on the gold transactions of the Government of India is complicated by exchange considerations. Taking the transactions as a whole, the Government of India estimated that for the year 1920-21 a net loss would accrue. I am also sending to my Hon. friend a copy of the reference to the subject in the Government of India's Budget.

Proposed Fiscal Commission

Mr. Robert Richardson asked the Secretary of State for India whether he would lay upon the table the correspondence which had taken place between the Government of India and him on the question of Imperial Preference.

Mr. Montagu.—The communications which have passed between the Government of India and myself on this subject were of a confidential character, and I do not think that any useful purpose would be served by their publication. Especially, I understand that the Government of India are now considering the advisability of appointing a Commission to consider the whole question of the future fiscal policy of India.

"I understand"

INDIAN EXCHANGE PROBLEM

What may almost be termed the Indian exchange disorganisation shows little sign as yet of being straightened out, and it becomes more and more plain that considerable mis calculations have been made by the India Government as to the practical results of the policy initiated in February last. The point which is found most difficult of elucidation is the fact that whereas the latest India currency scheme set out to tie the rupee to gold and not sterling with the ultimate prospect of a stable exchange at 2s. when the premium on gold had disappeared. The exchange is not now moving with gold but on the contrary stands at several pence below the par of exchange formed by the present price of gold in the London market. Inquiries in well-informed circles have elicited several causes for this apparent anomaly which have been alluded to in these columns but we are inclined to believe that while these have undoubtedly

contributed to the present position the root of the trouble lies in the internal currency policy which we gather is still being pursued by the India Government. By restricting the exports of gold and by maintaining an internal ratio of 15 rupee to the sovereign, the authorities are effectively preventing the exchange from following the movements in the price of gold. The continued maintenance of the old ratio in India seems to invalidate the spirit of the Currency Committee's scheme and a frank exposition on the part of the India Government clearing up some of the points on which no official enlightenment has been forthcoming, since the currency scheme was put into force would undoubtedly be welcomed by the many trading interests in whose business the Indian exchange is a matter of primary importance.

Exchange Banks Attacked

Another aspect of the Indian exchange position which it seems desirable again to touch upon is the active propaganda which is evidently being carried out in India among native trading and banking interests inimical to the Anglo-Indian exchange banks. Cables from Bombay and other centres are repeatedly indulging in tirades denunciation of the group of exchange banks which are alleged to be profiting in a most flagrant manner in connexion with the sale of the India Government's reverse Council drafts. The disparity existing between the Government's selling rate of the £1,000,000 a week which it is now selling and the market rate at which the banks will sell sterling drafts is well known. But to give any grounds for the attack now being made on the exchange banks it would be necessary to establish the fact that these banks secured the whole or at least the major portion of the reverse Councils offered for tender. The actual proportion secured by each of the exchange banks during the past three weeks is we understand as follows.—May 7, 14 per cent of the total offered; May 14, 1 per cent; May 21-29, 2 per cent. That is to say the exchange banks secured between them something like 8 per cent of the total and assuming that their allotment even went so high as 10 per cent there would still remain £900,000 of reverse Councils going elsewhere, and these Indian propagandists seem curiously silent on this point.

The Times

THE SOUTHERN INDIA SKINS AND HIDES MERCHANTS ASSOCIATION.

AT the Second Annual Meeting of the Southern India Skins and Hides Merchants Association Madras held last month Mr. Husein M. Jamal Muhammad Sahib Bahadur as President delivered an important address from which the following are extracted:

Export Duty

We requested Government not to levy an Export Duty of 10 per cent on the export of Raw Skin and Hide. While we are thankful to Government for accepting the principle involved I regret to have to say that the suggestion of our Association remains unacted as it does the principal tanning interests in the country was not given due weight. Government have not only fixed the Duty at the lower figure of 10 per cent but have also allowed a Rebate of two thirds of the Duty for destinations within the Empire. Now for this reason this method of protection has not had the desired effect and we still receive large quantities of our raw material taken away to other countries to strengthen their own industrial position to the great detriment of our own industries although we have in this country tanning material sufficient to double and even treble the present output of Indian Tanned Skins and Hides.

Rebate on Export Duty

Since the object of the Government in imposing this Duty is to develop the Industry as far as possible within the country itself, I cannot see the wisdom of giving a Rebate of two thirds of the Duty to European destinations. Let me illustrate my argument with a specific instance. On the export of raw stuffs to Canada there is a duty of 5 per cent while 15 per cent is levied on those exported to U.S.A. Now this will only have one effect and it is this. American tanners our chief rival may prefer to have some factories in Canada import our raw materials at the reduced rate of duty and after manufacturing there send them over to U.S.A. or other countries for sale. In fact according to my information, they have already started putting up factories in Canada to have the advantage of the reduced rate of duty. Our Association has been all along pressing on Government at least to reduce the Rebate to one third of the Duty. But the Government have not so far complied with our request. To close the loophole afforded to American tanners to evade the Duty as pointed out above, it is to be hoped that the matter will receive the prompt and sympathetic attention of Government and that they would take

immediate steps to abolish the Rebate altogether, or in the alternative reduce it to one third.

Exchange and Currency

As you all know the abnormally high level of Exchange has been and is still seriously affecting our industry and export trade. In fact, this is one of the principal causes why we find our tanning industry in a worse position than it was six months ago in spite of some little protection given by the present system of the Export Duty. It is much to be deplored that Government should by hasty and questionable methods try to keep up the Exchange and even to raise it by leaps and bounds. I refer to the sales of enormous amounts of Reverse Councils on London at very high rates. The sale of these Reverse Councils cannot in any way be justified so long as there is a balance of trade in favour of India. On the other hand their sale at a forced up rate of Exchange results not only in heavy losses on the accumulated reserves of the Government of India in London, but also though temporarily has the effect of keeping up the Exchange at a higher level than it would otherwise be the cause to the great and lasting injury of the industry, production and export trade of India. The announcement recently made by Government reducing the sale of Reverse Councils to one million a week induces me to think that they have come to realize their mistake and I trust the sale of Reverse Councils will soon be totally stopped. What is more desired to relieve the present tension in the Exchange and Currency of the country is to allow the free importation of Gold into the country a measure which both the majority and minority Reports of the Currency Commission have agreed in strongly urging. Our Association in their statement sent to the Currency Commission had also strongly urged it. When our neighbouring countries can get Gold freely against goods supplied by them I do not see why British India alone should be denied that benefit by our own Government. In spite of all this it is most regrettable that Government has not yet removed the restrictions against the free importation of Gold into the country. I earnestly trust that before long Government will do so.

Imperial Preference

When India is about to get Fiscal Autonomy, it is but fair and proper that the question of Imperial Preference should be left open to be decided by the enlarged Legislative Councils, in consultation with the leading industrial, commercial and economic interests of the

country When we see the sort of Imperial Preference involved in the 10 per cent Rebate off the present Export Duty on Raw Skins and Hides and when we realise its adverse effects on our Industry, I should consider that the authorities and the public of this country should pause and ponder deeply before they commit themselves and India to any system of Imperial Preference in advance without fully threshing out the question in all its bearings

Representation on Legislative Councils, Etc

I much regret that our Association representing, as it does the tanning industry of this Presidency and one of the foremost in the country, should have been completely ignored in the allotment of seats in the Reformed Madras Legislative Council The magnitude and importance of the Tanning Industry to this province will be realised when it is seen that out of the total value of Rs 9,56,00,220 of Tanned Skins and Hides exported from India during the official year 1918-19, Rs 7,45,299 represented the value of exports from the Madras Presidency alone, that is about three-fourths of the total for the whole of India

Import duty

In view of the fact that at present a good many factories for turning out finished leather are springing up in the country, it is disappointing to find that our recommendation to protect and develop this industry by increasing the Import Duty of 7½ per cent now levied on imports of finished leather to 15 per cent has not been accepted Government which is solicitous of the industrial development of the country should show its sympathy in a practical manner by affording us the protection asked for above, until at any rate our industries are given a fair start and become safely established

Present Conditions of Our Industry

You all know that owing to various causes, all more or less due to the effects of the recent great world war, principally because of the adverse exchange and financial conditions of the European countries and their consequent inability to buy at present and because of the stocks in London being too heavy to be absorbed locally and also because of the too low Rupee value we get for our stuff on account of the highly enhanced Rupee sterling exchange our Tanning Industry is having a very bad time now To protect and safeguard our interests we are working to introduce a co-operative system among the tanners and others concerned in the trade I trust that it will, with your support, reach a satisfactory consummation and that our tanners and our Industry then be enabled not only to withstand the present crisis but also be enabled to come out of it more strengthened and securely founded

Leather Trades School

It is only fair that Government should utilise at least a portion of the revenue derived from the Export Duty on Indian Raw Skins and Hides to the development of the Tanning industry of the country There is a Leather Trades School in Madras but I understand that it is not being worked on sound and efficient lines owing to the insufficient scope afforded to it financially and otherwise When India is on the threshold of rapid industrial development and when the Tanning industry is of such enormous importance to this Presidency I feel that Government should give early attention to the re-organisation of the Madras Leather Trades School on a liberal scale

MINING IN INDIA.

Demand for Chromite

The demand for chrome during the war and the great price to which chromite was pushed, led to a considerable investigation of the deposits in India with some not unimportant results

A recent Indian Geological Survey report deals with the investigations made in Singhbhum where chromite was discovered some few years ago, and since when some 8,000 tons of chromite have been exported Whereas the chromite deposits of Baluchistan are usually in the form of irregular masses or lenses, rendering the making of reliable estimates of ore available difficult,

the Singhbhum deposits are definite bands, which, in some cases have been traced by quarrying operations for thousands of feet As regards economic prospects these chromite deposits of the Kolhan may be stratigraphically continuous to as great depths as the enclosing ultra-basic rocks, but the thinness of the bands of chromite and the numerous small faults will, in the opinion of the geologists who examined them, render it economically impracticable to resort to underground mining Thus it seems probable that the industry will cease as soon as all the ore that can be extracted by open-cast has been removed At present only first-

grade ore is shipped, but the possibility of treating in concentration mills low grade ore containing not less than 10 per cent Cr_2O_3 is left over for consideration, especially if future prospecting should lead to the discovery of additional peridotite masses in the unexplored portions of the Kolhan to the south.

Of more importance than the Singhbhum discoveries would appear to be those made in the Mysore State. These are of course, under the surveillance of the Mysore Government and its own Survey. Some of them were prospected in the seasons of 1902-5 and ore along the Nuggihalli-Arsekere strike but it required the stimulus of the war to lead to their development and the discovery of others, and so far with the exception of those which follow we have not seen any report of the developments which have been undertaken. Of these the most important mine open is that of Bairapur from which something like 6,000 tons of ore averaging about 50 per cent of chromic oxide was obtained during 1918 and the beginning of this year under a mining license granted by the Government which expired in March last. The Government refused further extension as they are desirous of monopolising the industry as far as possible possibly in connection with schemes for the manufacture of ferrochrome. Schemes have been discussed for utilising power from the Cauvery Falls, and estimates sought as to costs and other technical matters from existing works in this country. We have not, however, learned of these suggestions going beyond the stage of discussion and the outline, therefore, as well as the ultimate policy of the Mysore Government, is still undisclosed.

A representative complete English analysis of a shipment of 1,200 tons of Bairapur reef ore gave—
Oxide of chromium, 51.10, protoxide of iron 21.44, peroxid of iron 1.03, alumina 7.60, 60 lime, magnesia 12.10, oxide of manganese 3.0, silica 4.50, sulphuric acid, .05, combined water &c. 1.50 and a very severe sample from 10,000 tons of reef ore mixed with powder and surface pebbles gave by analysis in India—

Cr_2O_3	Iron	Silica	Alumina	Calcium	Magnesia
49.61	26.21	9.87	6.21	2.63	11.77

Four representative samples drawn from quantities approximating 6,000 tons of pebbles gave 51.80 per cent, 52.30 per cent, 51.29 per cent, 51.66 per cent of Cr_2O_3 . These pebbles are smallish in size and by weathering become hard and smooth.

Besides the Bairapur mine there are other deposits such as—

Navley open-cast, producing a blueish ore speckled with magnetite spots, actual English analyses of ship-

ments to this side giving over 50 per cent Cr_2O_3 , other elements being 24 per cent iron, 11 per cent alumina, 4 per cent silica, 10 per cent magnesia. Normally this mine could produce 500 tons monthly. Fairly heavy stocks are held ready for shipment.

Sinduvalli opened in 1907 and shipments since have averaged 50.9 per cent Cr_2O_3 . Taking the average of six shipments the English analysis is—

Cr_2O_3	FeO	Al_2O_3	MnO	SiO_2	MgO	Phos
50.64	16.1	18.29	1.44	1.86	14.65	.06

It is a hard ore of a bright steel blue tint. Extraction involves comparatively deep mining and under present conditions would produce 250 tons monthly.

Arsikere open-cast, lower grade proposition from which unlimited supplies are accessible, apart from important stocks at present and ready for shipment. Careful sampling and analysis over a quantity of 7,500 tons gave an average of 40.57 per cent Cr_2O_3 and a complete analysis of 1,000 tons gave 40.17 per cent chromic oxide, 18.94 per cent iron, 8.46 per cent silica, 14.10 per cent alumina, 2.15 per cent calcium oxide, 1.77 per cent magnesia. Lump ore, carrying 54.0 per cent Cr_2O_3 can be assured in quantities from this deposit and is suitable for furnace linings.

These and other mines are not restricted in the matter of title in the same way as Bairapur.

The prospective importance of the Mysore deposits is due to the fact that occurrences of chromite have been observed over an extensive area amounting to 80 square miles, and when more work has been done upon them we shall be better able to judge their continuity and depth. Communication to Madras and Marmagao is reasonably convenient, carriage amounting to around Rs. 10 per ton.

The future of these deposits is of many others, must depend greatly upon the future price which the mineral commands. The Chrome Trust controlling as it does the deposits of Rhodesia and New Caledonia, succeeded in raising prices to a high level during the war but with the opening up of the well known mines of Asiatic Turkey competitive supplies may be brought into existence which will further reduce quotations to something more nearly approaching the pre-war basis (*London Mining Journal*).

THE STAGES OF COMMERCIAL LIFE

Mr L. R. Tairce contributed a very interesting article on "Frenzied Finance" to "Sanj Vartaman".

The First stage in Law. In the beginning, men supplied their wants by force or cunning as might was

right. As the stronger could overcome the weaker to satisfy their desire the weaker units joined together. People began to frame rules and regulations governing the conduct of their lives and their relations with one another.

The second stage is money. During the days of barter when people had to exchange commodities, articles like a cow could not be divided and perishables like fruits could not be preserved long enough to accumulate and to exchange for other articles. The necessity for an article to serve as a medium of exchange was therefore felt.

The third stage is Life Insurance. The value of a man's life to his dependents was realised when, on his death, his wife and dependents were deprived of the livelihood he obtained for them. Men began to insure their lives by contributing to a fund all their lifetime which would entitle them at death to leave their heirs a sum in proportion to the amount of their contributions to the fund, less the expenses for managing the fund.

The fourth stage is Fire Insurance. People had to guard against fire and other accidents so that a fund was created out of the contributions made by the individuals to which they were entitled in the event of fire and other contingencies.

The fifth stage is the bank. In course of time people began to accumulate money in excess of their wants and requirements and all such surplus was lodged in a common place of safety where experts in the line handled and made use of the money thus collected from individuals by safeguarding and lending it to others.

The sixth stage is Limited Companies. When an enterprise was owned and conducted by several persons, increasing difficulties were experienced in defining their relationship with each other and as to their common property. Then the idea arose of treating such an enterprise as a separate entity having a status quite distinct from the individual taking part in it and capable of doing all things the individual might. The ownership of the whole is represented by certificates of shares, stocks or bonds which could be transferred from one to another without in any way interfering with the enterprise. The liability of the holders of shares was restricted or limited to the amount of the shares possessed by each holder. The law relating to the creation and conduct of such limited companies provided regulations compelling them to keep their affairs in such a manner that all could ascertain of what each consisted.

The seventh stage is the Stock Exchange. As the Joint Stock enterprises grew large and multiplied, it was

felt that there should be a place where the value of the shares might be ascertained by purchase or sale under the supervision and control of experts. Hence a common market place was created where all those having shares to buy or to sell could meet conveniently and the prices quoted there were made known to the world.

MILLED RICE AND BERI-BERI

To those who use rice eaters, it is a matter of no trivial importance to know something of the rice they eat. It is well known that white table rice is not acceptable as a staple food for coolies. The *ballam* boiled or brown rice is always shipped for the coolies in the West Indies. Burma produces two qualities—Burma and country rice. Burma rice has the husk, pericarp and outer layer removed by machinery. Country rice is soaked in water for at least a day and a night and then is steamed and dried in the sun. The husk is then roughly removed. It therefore retains most of the pericarp and outer layers which contain Protein and phosphates. The use of milled rice is said to produce beri-beri owing to the absence of the organic phosphates in these outer layers. So said Sir Pardee Lukis in his book on Tropical Hygiene. And the Burma or Rangoon rice is exported to India.

According to the latest German investigation into the subject of food values it has been demonstrated that the value of the cuticle of the various grains, which is removed by excessive polishing, does not lie solely in the salts they contain, but the cuticle contains a vital though mysterious principle to which the discoverer gave the name of 'vitamin'. It has been stated beyond doubt that if the vitamins are absent the animal perishes and dies even in the midst of plenty. It has also been experimentally proved that hyper-anæmic disorders, such as beri-beri and pellagra can be induced in animals by feeding with de-vitaminised food. The addition of the salts lost in the removal of the cuticle from other sources does not save them. If the vitamin is absent beri-beri supervenes to a certainty. Pellagra is more difficult to induce but it also is a consequence of de-vitaminised food. Burma rice as described by Sir Pardee Lukis is essentially such a food. It is dangerous to health to make it a staple. The planters should see that their coolies are protected from the consequences of such a diet or their labour "force" will deteriorate.

Sir Pardee Lukis is somewhat contemptuous of rice as a food, as he said 'Rice is the poorest of all cereals in proteid fat and mineral matter. On the other hand it has fully 76 per cent of starch. The starch has the further advantage of being present in

small and easily digested grains. When boiled rice swells up and absorbs nearly five times its weight of water while some of its mineral constituents are lost by solution. It is preferable therefore to cook it by steaming. Rice is only moderately easy of digestion in the stomach. 2 ounces cooked by boiling, requiring 3 hours for its disposal. This is due to the fact that it is not the function of the stomach to digest carbohydrates; it merely passes the rice on to the intestine where it is absorbed with very great completeness. Its solid constituents enter the blood as completely as those of meat. This is due to the comparative absence of cellulose. Practically none of the starch is lost, whereas the waste of Protein food amounts to about 10 per cent. It follows from this that rice is one of the foods which leave the smallest residue in the intestines and

this gives it a considerable value in some cases of disease. The nutritive value of rice is much impaired by its poverty in protein and fat. Hence it is not adapted to be an exclusive diet but should be eaten along with other substances, rich in these two elements, such as dal, ghee and eggs. Even as regards carbohydrate it would require about 6 pounds, three ounces of rice to furnish the daily needs of an active man. This would entail the consumption of about 5 pounds of cooked rice daily. Yet rice is known to be the staple food of three quarters of the human race. In the best interests of health rice eaters should see that the rice they eat is of the proper quality and contains the essential element of Vitamin. In the interests of public health, the rice mill owners should take note of this.

NEWS AND NOTES.

Account for Income-tax. The notification dated March 25 1920 issued by the Local Government states that "When the production of accounts is required under section 14(2) of the Act of the accounts are not maintained either in English or in one of the vernaculars of the Presidency or in Tamil, Telugu, Malayalam, Kannada and Oriya a translation of the account which is in English or in one of the vernaculars of the Presidency shall be produced along with the original."

Nagavalli Project, Vizagapatam District. The Nagavalli River takes its source in the Eastern Ghats in the Vizagapatam Agency and flows into the Bay of Bengal through the Palakonda tidal drainage area of 3,92 sq miles of which 168 sq miles are above the Dam. The richness of the silt brought down by the river is proved by the fact that the lands watered by the river yield two or three crops. In 1888 the Government began the investigation of the irrigation project which was completed in 1901 when a preliminary report was submitted to Government. In 1902 proposals and estimate with plans for Rs. 10,82,000 were sent up and recommended for sanction in 1903. It was expected to irrigate 17,200 acres to earn a revenue of Rs. 84,000. The project was sanctioned by the Secretary of State and the work commenced in 1905. Owing to high cost for imported labour and other causes the cost increased and a revised estimate for Rs. 18,16,000 was sanctioned in 1912. In 1918-19 20,855 acres were irrigated and the proposal to irrigate 31,200 acres proved a failure. It is estimated that the total capital investment 10 years after the completion of the work will come to Rs. 21,37,678 and the net revenue to Rs. 68,000 calculated on an irrigated area of 23,100 acres. Thus the investment pays an interest of hardly 4 per cent. It is a matter of consolation that in 1918-19 the year of the widespread failure of the paddy harvest, the project irrigated about 20,000 acres resulting in a good average crop which averted famine in the District.

Government aid. The Government have sanctioned that a sum not exceeding Rs. 25 be granted as a free gift at the discretion of the District Magistrate to adolescents released from the Bangalore Borstal Institution with a view to set the boy up in life by providing with tools for his trade.

The International Labour Conference. Under the terms of the League of Nations Covenant in the Versailles Treaty of Peace the International Labour Conference has been organized to be held at Geneva on the 15th June to consider questions relating to seamen, 12-hour day of labour, minimum scales of accommodation, the provision of facilities for finding employment, the prohibition of child labour and other cognate matters. The Government of India as a member of the League of Nations will participate in the conference. 2 Government delegates, 1 Employers' delegate, and 2 advisers to them, and 1 work people's delegate with 2 advisers and an interpreter are to attend.

Panchayat courts. The Local Government have decided to establish Panchayat courts in 40 villages in Krishna District, 10 of the Chittoor District and 26 of the Bellary District.

Fisheries Department. The Government have sanctioned the appointment of 1 Assistant Inspectors on Rs. 30 to 50, 2 Overseers on Rs. 20 to 30 and 2 fieldmen on Rs. 12 to 15 and 15 to 20 to the Assistant Director of Fisheries (Inland).

The Accounts of Government Industrial concerns. In view of the representation made that the system of book-keeping in the Government Treasury and of budgeting for receipts and expenditure is not suited to give a clear view of the financial results of the industrial concerns started and conducted by the Government such as the Kerala Soap Institute Calicut, the Beypore Cannery and the Jam and Pickle Factory, Coonoor, and that a grant should be earmarked for each

Industrial Concern, drawings being charged against it and all proceeds credited to that account, the Government have appointed a Committee with the Hon'ble Mr A Y C Campbell C I E, I C S, Director of Industries, Madras, as Chairman and convener and the following gentlemen as Members —

- 1 The Director of Agriculture
- 2 M R Ry 1 K Rajagopalan Ayl, Examiner of Local Fund Accountants
- 3 Mr Ian Fraser of Messrs Fraser and Ross, Chartered Accountants
- 4 M S E Wood of Messrs Parry and Co. The majority are Government Officers and no non official Indian has been placed on the Committee

The Committee will consider, among others the following points —

(1) What system of finance and accounts should be adopted in —

- (a) Pioneering and Experimental Factories
- (b) Demonstration and Instructional Factories
- (c) Industrial and Training Institutions run on Commercial lines

(2) Whether in the case of such factories and institutions there should be a relaxation of the rules in the Civil Account Code and if so how the proposed system of finance and accounts should be linked with the Government system and accounts

(3) What powers of purchase shall the Manager of such a Factory or institution should ordinarily possess and what safeguards should be provided should Boards of Directors be appointed for such factories and institutions and if so, on what terms

(4) Whether it is necessary for the Manager of such a factory or institution or the head of the Department to have power to place order outside India for stores direct instead of through the Director General of Stores India office

The College of Agriculture Coimbatore Attention having been called to the defects in the quality of students seeking training in this College the Government appointed a Committee consisting of

- (1) Mr R C Wood M A
- (2) The Hon'ble Rao Bahadur V K Ramanujachariar Averghal
- (3) The Hon'ble Rao Bahadur T Balaji Rao Naidu Garu
- (4) M H Champion, M A, and
- (5) The Reverend S D Bawden

to consider how the standard for the diploma and certificate Examinations of the College could be raised with special reference to the feasibility of attracting a better class of Students and of improving the training imparted in the College

At present, certificates in agriculture are awarded to students undergoing a two years course in practical

agriculture. Students showing special merit in this course are permitted to undergo a further course of 1 year's training in the sciences allied to Agriculture and are awarded the Diploma which entitles them for posts in the Upper Subordinate and the Provincial Services of the Department. The training received by the Diploma holders is considered inadequate owing to the defective nature of the general education whereby students seeking admission are not benefited by the Specialised scientific instruction

The Committee have recommended to improve the pay and prospects of the services of the Department to grant travelling allowances to officers of the lower grades to grant scholarships to students of particular districts and classes and to re-examine the question of affiliation of the college to the University

The Government have accepted the Committee's recommendation to separate from the outset the courses for the diploma and the certificate the former being made open to students of the Intermediate standard of the University and to cut down the course from 3 years to 2 years. The Government have also sanctioned the award of 20 Scholarships of the value of Rs 25 per annum to students to be admitted to the Diploma course with free tuition and lodging. The new diploma course will be introduced with effect from the current year. The Director has been requested to pay special attention to the remarks of the Hon'ble Mr V K Ramanujachariar in his minute emphasising the necessity to raise the standard of practical training of the diplomates to fit them to occupy the higher posts in the Agricultural Department and to guarantee to the first diplomate of each year a post in the Provincial Service

The Asiatic Enquiry Commission This Commission have issued their interim report dated May 19th, 1920 to the Governor General of South Africa, which according to a *Press communique*, is as follows —

'During the course of our enquiries strong evidence has been laid before us which tends to show that there is at present owing to the shortage of rice and other causes, a considerable number of Indians who, with their families would be prepared to return to India if opportunity were afforded them

We have also had evidence from an influential Calcutta merchant, at present on a visit to the Union, who until recently, was Chairman of the Central Employment and Labour Board under the Government of India that at the present time, owing to industrial development, the labour supply in India is insufficient to meet the demand and that good wages are being paid

The evidence on these points is confirmed by Sir Benjamin Robertson and Mr G L Corbett, the official representatives of the Indian Government

We therefore strongly recommend to Your Excellency that prompt steps be taken to provide the necessary shipping facilities and to appoint an official, well acquainted with the Indian mind and their methods, to act in a sympathetic manner, and to lay before the Indians the advantages of immediately returning to India

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